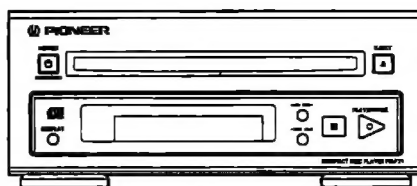


# Service Manual

**PIONEER**  
The Art of Entertainment



ORDER NO.  
**RRV1727**

## COMPACT DISC PLAYER

# PD-F21

THIS MANUAL IS APPLICABLE TO THE FOLLOWING MODEL(S) AND TYPE(S).

Type	Model	Power Requirement	Remarks
	PD-F21		
MY	○	AC220-230V	
NV	○	AC230V	

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# 1. SAFETY INFORMATION

**VARO!**  
AVATTAESSA JA SUOJALUKITUS OHITETTAESSA OLET ALTTIINA NÄKYMÄTTÖMÄLLE LASERSÄTEILYLLE. ÄLÄ KATSO SÄTEESEEN.

**ADVARSEL:**  
USYNLIG LASERSTRÅLING VED ÅBNING NÅR SIKKERHED SAFBRYDERE ER UDE AF FUNKTION. UNDGÅ UDSÆTTELSE FOR STRÅLING.


**VARNING!**  
OSYNLIG LASERSTRÅLNING NÅR DENNA DEL ÄR ÖPPNAD OCH SPÄRREN ÄR URKOPPLAD. BETRakta EJ STRÅLEN.

**LASER**  
Kuva 1  
Lasersäteilyn varoitusmerkki



**WARNING!**  
DEVICE INCLUDES LASER DIODE WHICH EMITS INVISIBLE INFRARED RADIATION WHICH IS DANGEROUS TO EYES. THERE IS A WARNING SIGN ACCORDING TO PICTURE 1 INSIDE THE DEVICE CLOSE TO THE LASER DIODE.

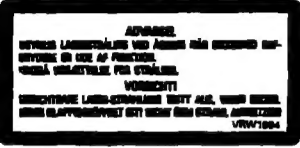
**LASER**  
Picture 1  
Warning sign for laser radiation



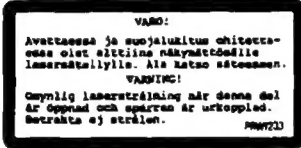
**IMPORTANT**  
THIS PIONEER APPARATUS CONTAINS LASER OF CLASS 1. SERVICING OPERATION OF THE APPARATUS SHOULD BE DONE BY A SPECIALLY INSTRUCTED PERSON.

**LASER DIODE CHARACTERISTICS**  
MAXIMUM OUTPUT POWER: 5 mw  
WAVELENGTH: 780 - 785 nm


## LABEL CHECK




MY Type



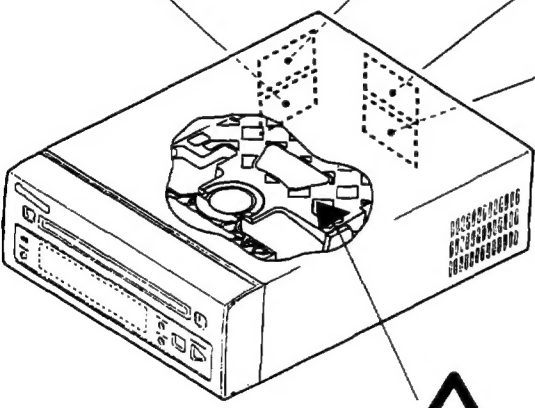
MY Type




MY and NV Types



NV Type



MY and NV Types



- Additional Laser Caution**
- Laser Interlock Mechanism**  
The position of the switch (S601) for detecting loading state is detected by the system microprocessor, and the design prevents laser diode oscillation when the switch (S601) is not on CLMP terminal side (CLMP signal is OFF or high level.). Thus, the interlock will no longer function if the switch (S601) is deliberately set to CLMP terminal side (low level).  
The interlock also does not function in the test mode\*. Laser diode oscillation will continue, if pin 1 of M51593FP (IC101) on the PRE-AMP BOARD ASSY mounted on the pickup assembly is connected to GND, or pin 19 is connected to low level (ON), or else the terminals of Q101 are shorted to each other (fault condition).
  - When the cover is opened, close viewing of the objective lens with the naked eye will cause exposure to a Class 1 laser beam.

'92S1B

\* Refer to page 28.

## 2. EXPLODED VIEWS AND PARTS LIST

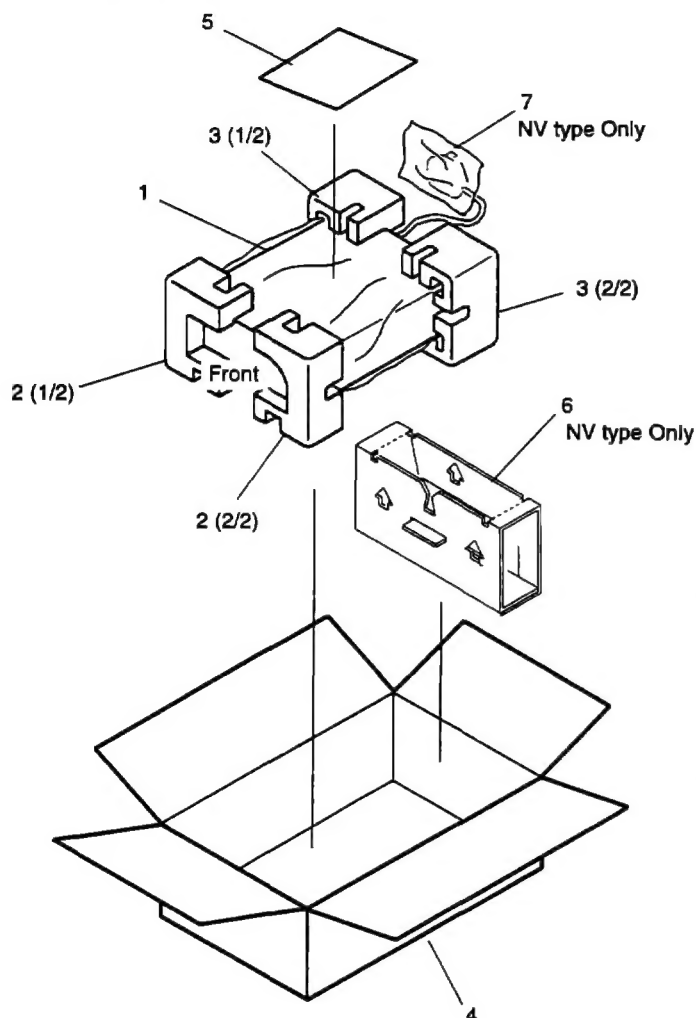
NOTES : ● Parts marked by “NSP” are generally unavailable because they are not in our Master Spare Parts List.

● The  $\triangle$  mark found on some component parts indicates the importance of the safety factor of the part.

Therefore, when replacing, be sure to use parts of identical designation.

● Screw adjacent to  $\nabla$  mark on the product are used for disassembly.

### 2.1 PACKING



#### (1) Parts List

Mark	No.	Description	Parts No.
	1	MIRROR MAT	DHL1050
	2	PAD F MTC	RHA1222
	3	PAD R MTC	RHA1223
	4	PACKING CASE	See Contrast table (2)
NSP	5	WARRANTY CARD	ARY7008
	6	SPACER	See Contrast table (2)
	7	POLY. BAG	See Contrast table (2)

#### (2) Contrast Table

PD-F21/MY and NV have the same construction except for the following:

Mark	No.	Description	Part No.		Remarks
			PD-F21/MY	PD-F21/NV	
	4	Packing Case	RHG1828	RHG1832	
	6	Spacer	Not used	RHG1836	
	7	Poly. Bag	Not used	RHL1021	



**(1) Parts List**

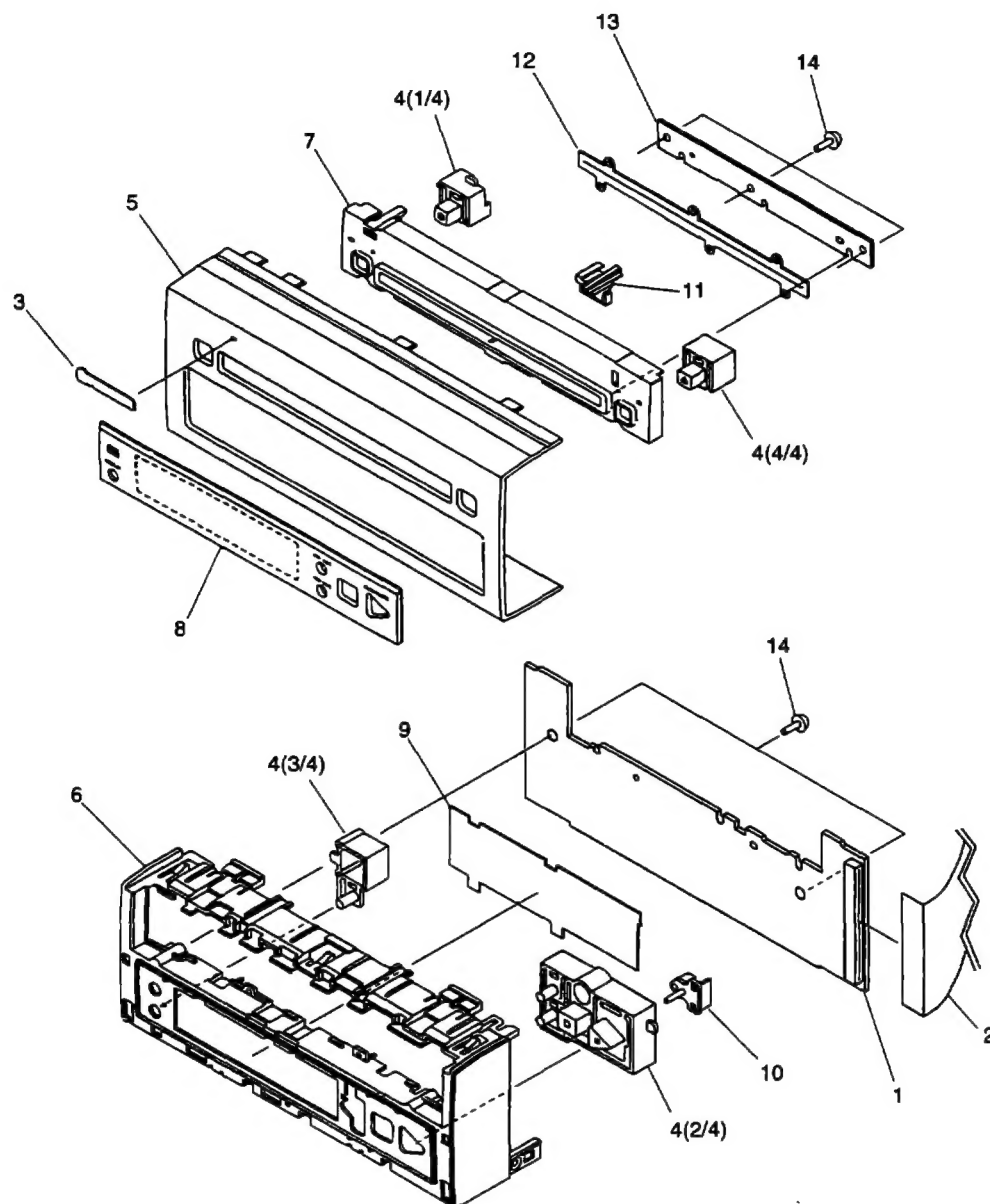
Mark	No.	Description	Parts No.	Mark	No.	Description	Parts No.
	1	MAIN ASSY	RWZ4210	NSP	16	CD SLOT-IN MECHA	AXA7014
	2	POWER ASSY	RWZ4083		17	BONNET MTCD	REA1266
	3	OPTICAL ASSY	RWZ4067		18	REAR PANEL	See Contrast table (2)
	4	STRAIN RELIEF	CM-22B	△	19	1P AC OUTLET	See Contrast table (2)
△	5	AC POWER CORD	See Contrast table (2)		20	SCREW	BBT30P080FNI
	6	CONNECTION CABLE	RDE1049		21	SCREW	BBZ30P080FMC
△	7	POWER TRANSFORMER (T1)	RTT1328		22	BINDER	ZCA-SKB90BK
	8	SCREW (3×8)	ABA7017		23	PLATE	RNM1050
△	9	FUSE (T2.5A)	AEK1058		24	CAUTION LABEL HE	See Contrast table (2)
NSP	10	PCB SUPPORT	AEC1006		25	CAUTION LABEL (F)	VRW-328
NSP	11	PCB SPACER (3×12)	AEC1372		26	CAUTION LABEL (G)	VRW-329
	12	FOOT	REC-434		27	CAUTION LABEL	See Contrast table (2)
NSP	13	CHASSIS MTCD	RNB1123		28	CAUTION LABEL	See Contrast table (2)
NSP	14	MECHA STAY CD	RNE1899	△	29	FUSE (T5A)	See Contrast table (2)
	15	INSULATOR F ASSY	RNK2231		30	BRACKET	RNE1938
					31	NYLON RIVET	AEC-525

**(2) Contrast Table**

PD-F21/MY and NV have the same construction except for the following:

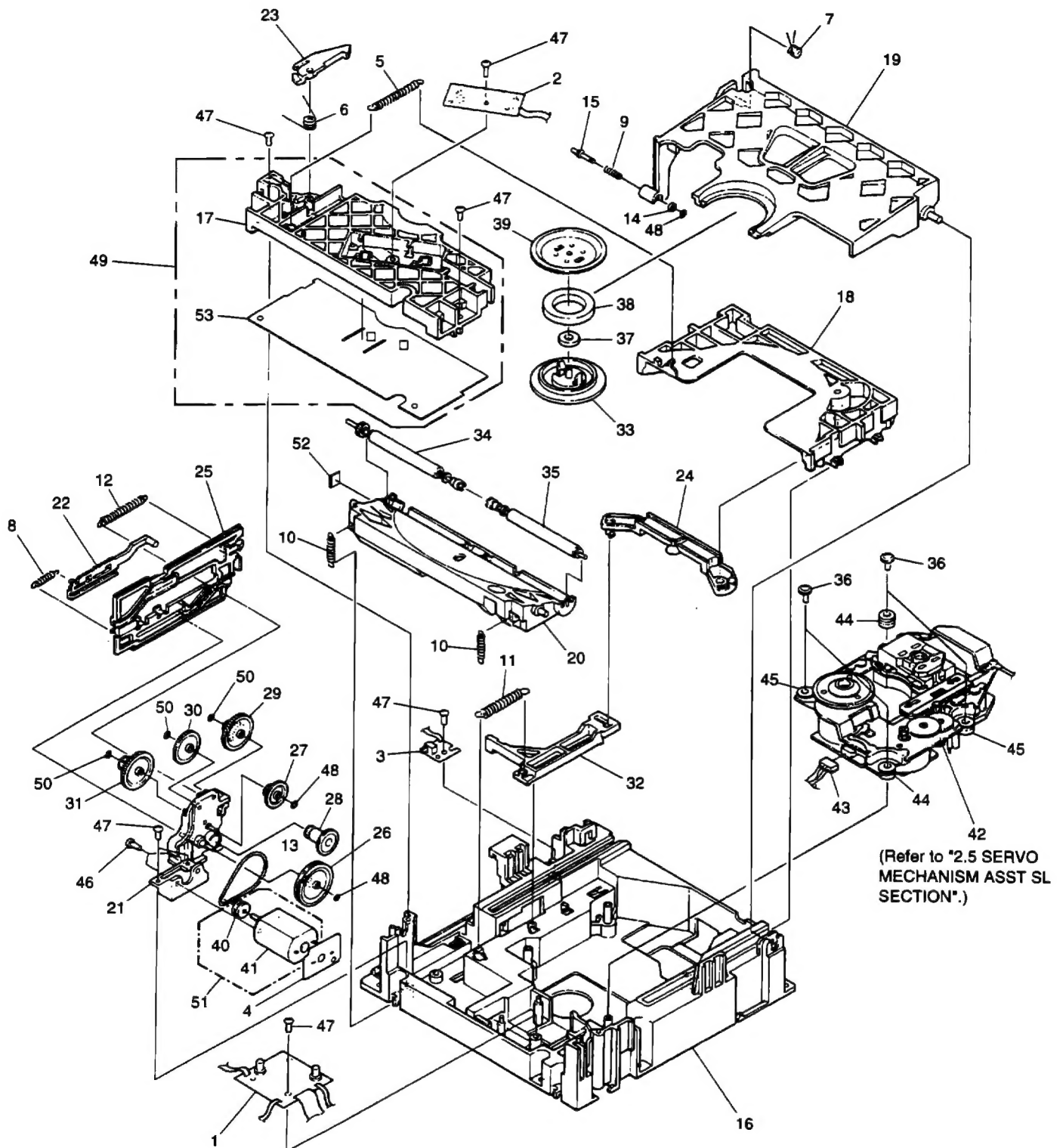
Mark	No.	Description	Part No.		Remarks
			PD-F21/MY	PD-F21/NV	
△	5	AC Power Cord	PDG1008	PDG1055	
△	29	Fuse (T5A)	Not used	PEK1003	
	18	Rear Panel	RNA2111	RNA2114	
△	19	1P AC Outlet	AKP1034	Not used	
	24	Caution Label HE	PRW1233	Not used	
	27	Caution Label	VRW1094	Not used	
	28	Caution Label	Not used	PRW1018	

## 2.3 FRONT PANEL SECTION



Mark	No.	Description	Parts No.	Mark	No.	Description	Parts No.
	1	FRONT ASSY	RWZ4065		9	FL FILTER CD	REC1288
	2	LEAD CARD 39P (J1)	RDD1380		10	PLAY LENS	RNK2232
	3	NAME PLATE	AAM1002		11	INDICATOR LENS CD	RNK2233
	4	FUNCTION BUTTON CD	RAC2142		12	SHEET	AWL7020
	5	FRONT PANEL	RAH2764	NSP	13	SLOT PCB	RNZ3240
	6	PANEL BASE MTC	RAH2767		14	SCREW	BBZ30P080FMC
	7	FRONT KIT CD	RAH2768				
	8	DISPLAY LENS CD	RAH2771				

## 2.4 CD SLOT-IN MECHA SECTION



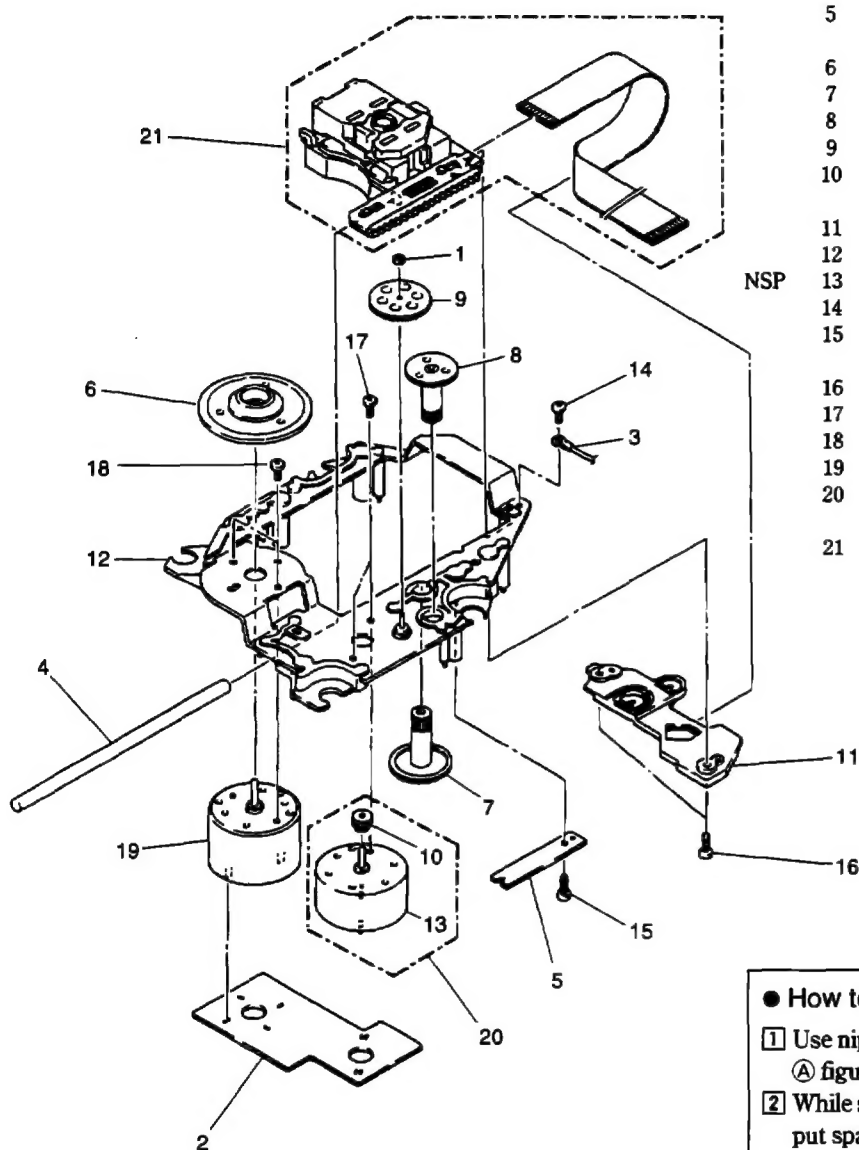
## Parts List for CD Slot-in Mecha Section

Mark	No.	Description	Parts No.	Mark	No.	Description	Parts No.
NSP	1	SENSOR PCB ASSY	AWZ7328		51	MOTOR ASSY	AEA7000
NSP	2	LED PCB ASSY	AWZ7329		52	AV SHEET	AEB7021
NSP	3	SW PCB ASSY	AWZ7330	NSP	53	DISC PLATE SHEET	AEB7035
NSP	4	MOTOR PCB ASSY	AWZ7331				
	5	SPRING	ABH7035				
	6	ROCK LEVER SPRING	ABH7019			OIL (GREEN)	GEM1015
	7	SLAMP SPRING	ABH7020				
	8	RACK SPRING	ABH7021				
	9	P SPRING	ABH7022				
	10	ROLLER HOLDER SPRING	ABH7023				
	11	SPRING B	ABH7024				
	12	CAM PLATE SPRING	ABH7025				
	13	BELT A	AEB7012				
	14	WASHER	AEB7018				
	15	PIN	ALA7005				
	16	MECHANISM BASE	ANW7022				
	17	DISC PLATE	ANW7023				
	18	CENTERING PLATE	ANW7024				
	19	CLAMPER HOLDER	ANW7025				
	20	ROLLER HOLDER	ANW7078				
	21	GEAR HOLDER	ANW7027				
	22	RACK	ANW7028				
	23	ROCK LEVER	ANW7029				
	24	STARTING LEVER	ANW7030				
	25	CAM PLATE	ANW7031				
	26	GEAR PULLEY	ANW7032				
	27	GEAR A	ANW7033				
	28	GEAR B	ANW7034				
	29	GEAR C	ANW7035				
	30	GEAR D	ANW7036				
	31	DRIVE GEAR	ANW7037				
	32	STARTING PLATE	ANW7038				
	33	CLAMPER	ANW7083				
	34	ROLLER ASSY L	AXA7019				
	35	ROLLER ASSY R	AXA7020				
	36	SCREW	PBA1048				
NSP	37	H SPACER	PEB1249				
	38	CLAMP MAGNET	PMF1014				
	39	YOKE	PNB1216				
	40	MOTOR PULLEY	PNW1634				
NSP	41	MOTOR	PXM1002				
NSP	42	SERVO MECHANISM ASSY SL	AXA7017				
	43	CONNECTOR ASSY 4P	PDE1238				
	44	FLOAT RUBBER	PEB1014				
	45	FLOAT RUBBER	PEB1132				
	46	SCREW	BMZ20P040FMC				
	47	SCREW	PPZ30P060FMC				
	48	WASHER	WT12D032D025				
	49	DISC PLATE ASSY	AEA7003				
	50	WASHER	WT17D034D025				



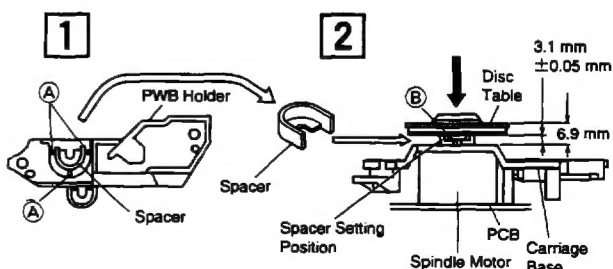
## 2.5 SERVO MECHANISM ASSY SL SECTION

Mark	No.	Description	Parts No.
	1	WASHER	WT12D032D025
	2	MECHANISM BOARD ASSY	PWX1192
	3	GROUND LEAD UNIT	PDF1104
	4	GUIDE BAR	PLA1094
	5	GEAR STOPPER	PNB1303
	6	DISC TABLE	PNW1608
	7	GEAR 1	PNW2052
	8	GEAR 2	PNW2053
	9	GEAR 3	PNW2054
	10	PINION GEAR	PNW2055
	11	PWB HOLDER	PNW2057
	12	CARRIAGE BASE	PNW2699
NSP	13	DC MOTOR (CARRIAGE)	PXM1027
	14	SCREW	BBZ26P060FMC
	15	SCREW	BPZ20P060FMC
	16	SCREW	BPZ26P100FMC
	17	SCREW	JFZ17P025FZK
	18	SCREW	JFZ20P030FNI
	19	DC MOTOR ASSY (SPINDLE)	PEA1235
	20	DC MOTOR ASSY (CARRIAGE)	PEA1246
	21	PICKUP ASSY	PEA1291



## ● How to install the disc table

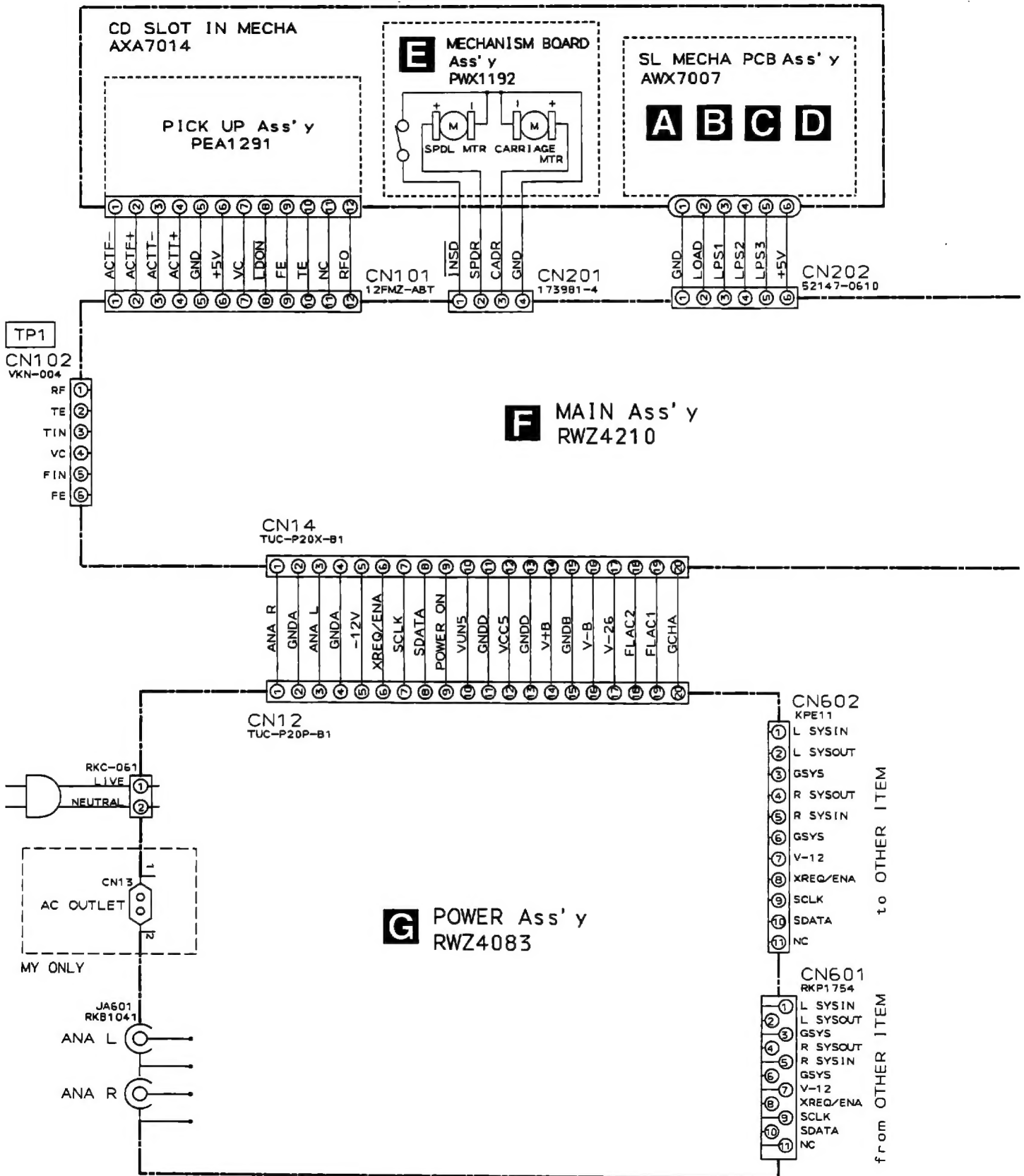
- ① Use nipper or other tool to cut the three sections marked (A) figure ①. Then remove the spacer.
- ② While supporting the spindle motor shaft with the stopper, put spacer on top of the motor base (angled so it doesn't touch section (B)), and stick the disc table on top (takes about 9 kg pressure). Take off the spacer.

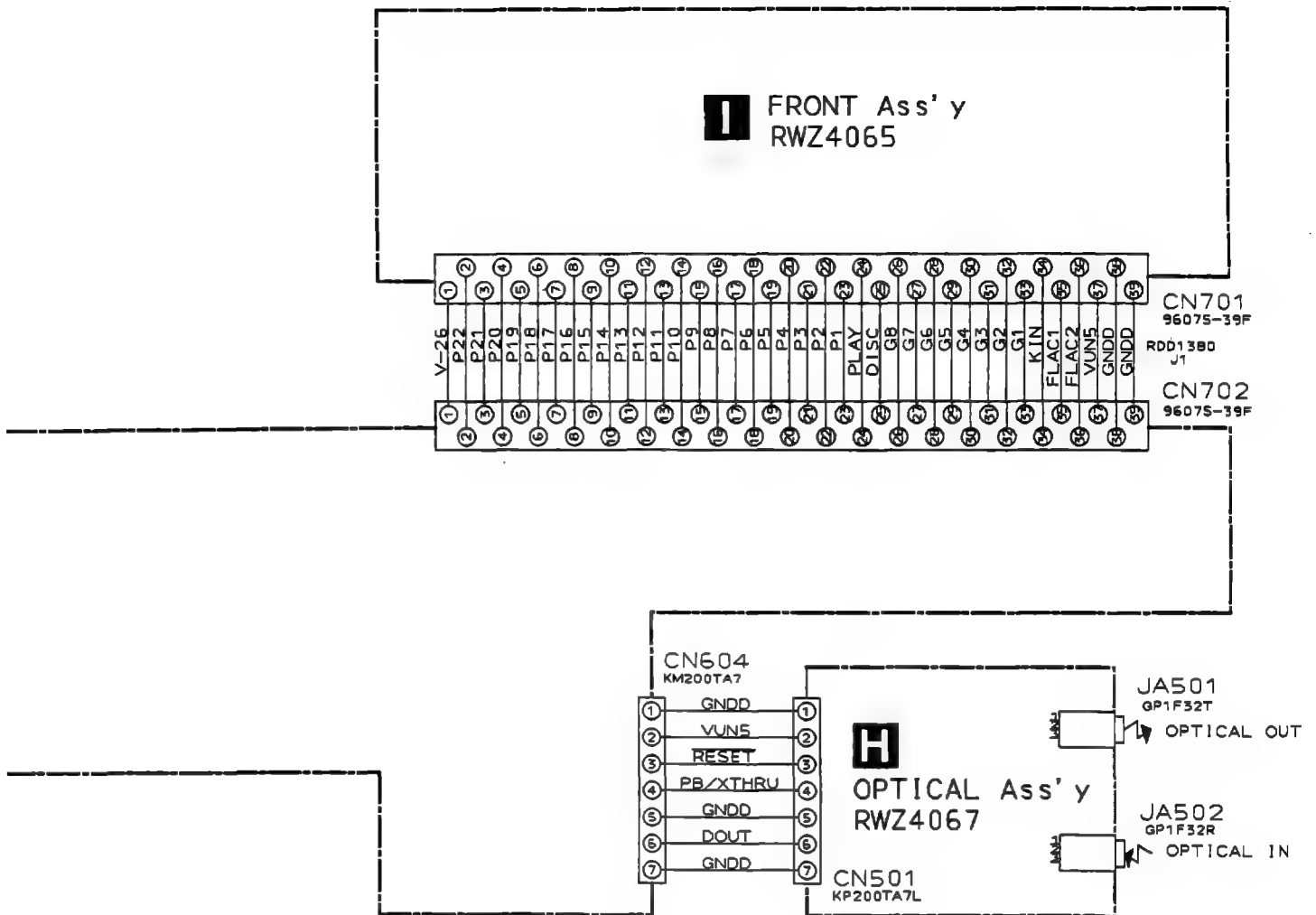


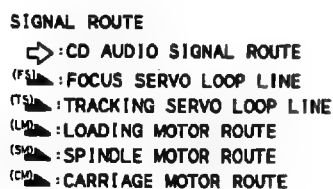
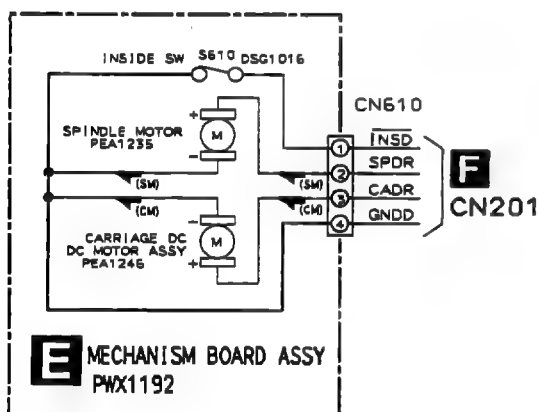
### 3. SCHEMATIC DIAGRAM

**Note:** When ordering service parts, be sure to refer to "EXPLODED VIEWS AND PARTS LIST" or "PCB PARTS LIST".

#### 3.1 OVERALL SCHEMATIC DIAGRAM














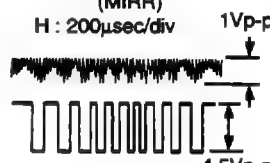


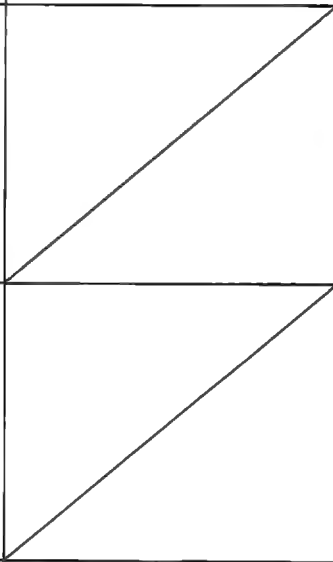






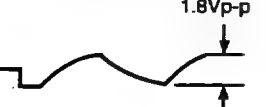
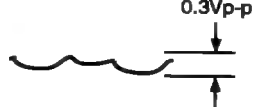

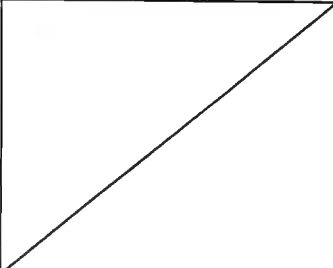
### 3.3 MAIN ASSY

#### Waveforms

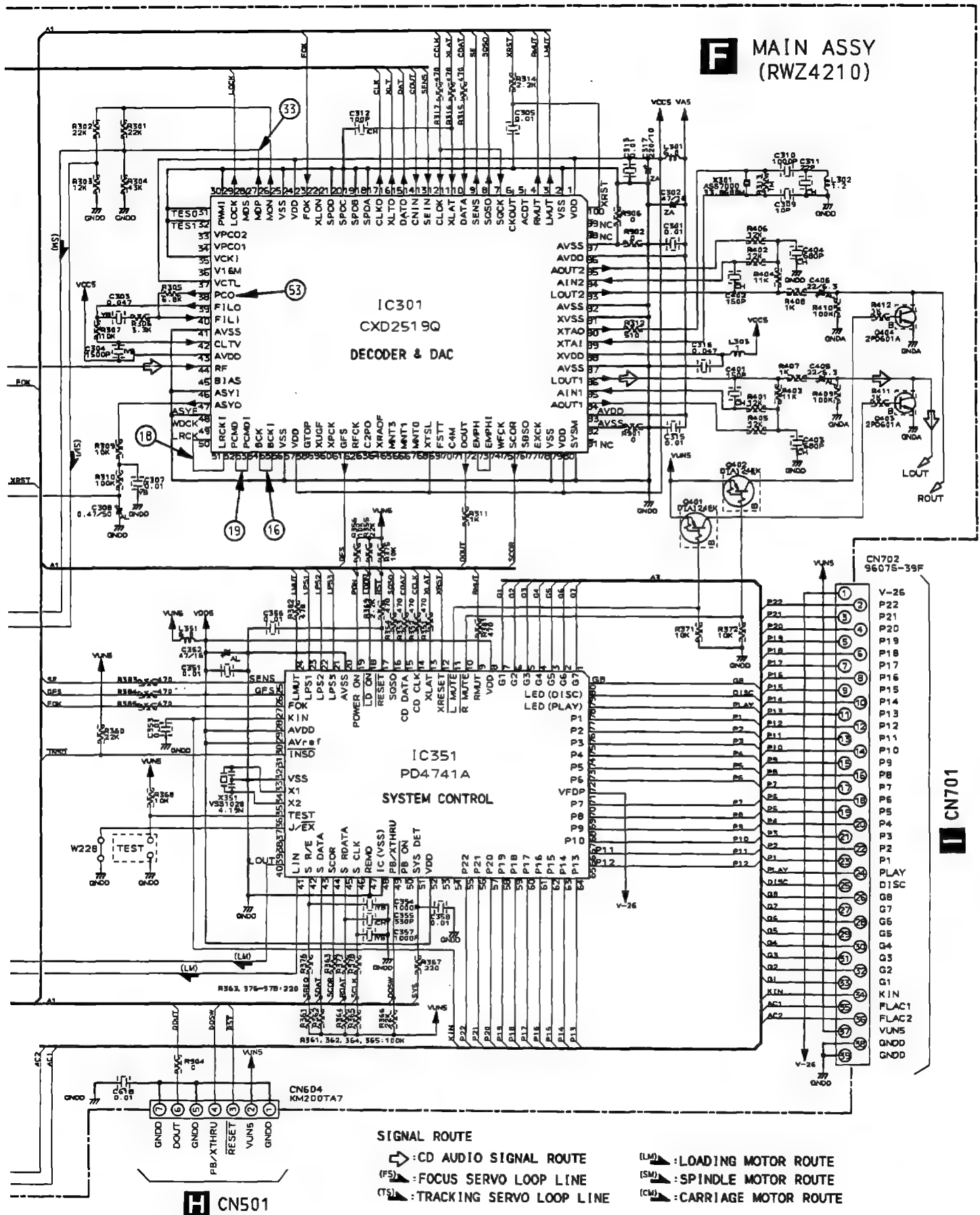
Note: The encircled numbers denote measuring point in the schematic diagram.

\*1 50T-JUMP: After switching to the pause mode, press the manual search key.

\*2 FOCUS-IN: Press the play key without loading a disc.

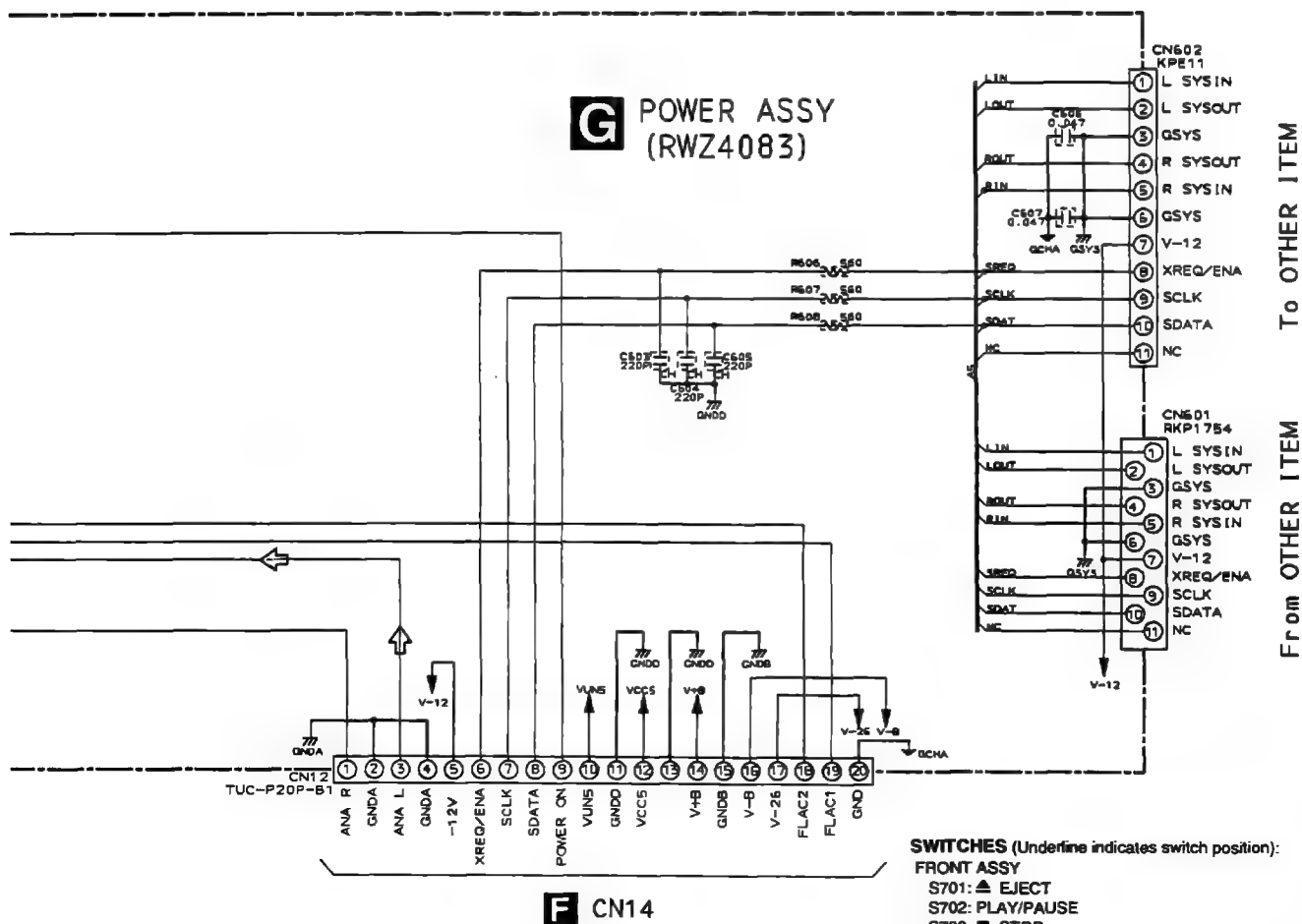
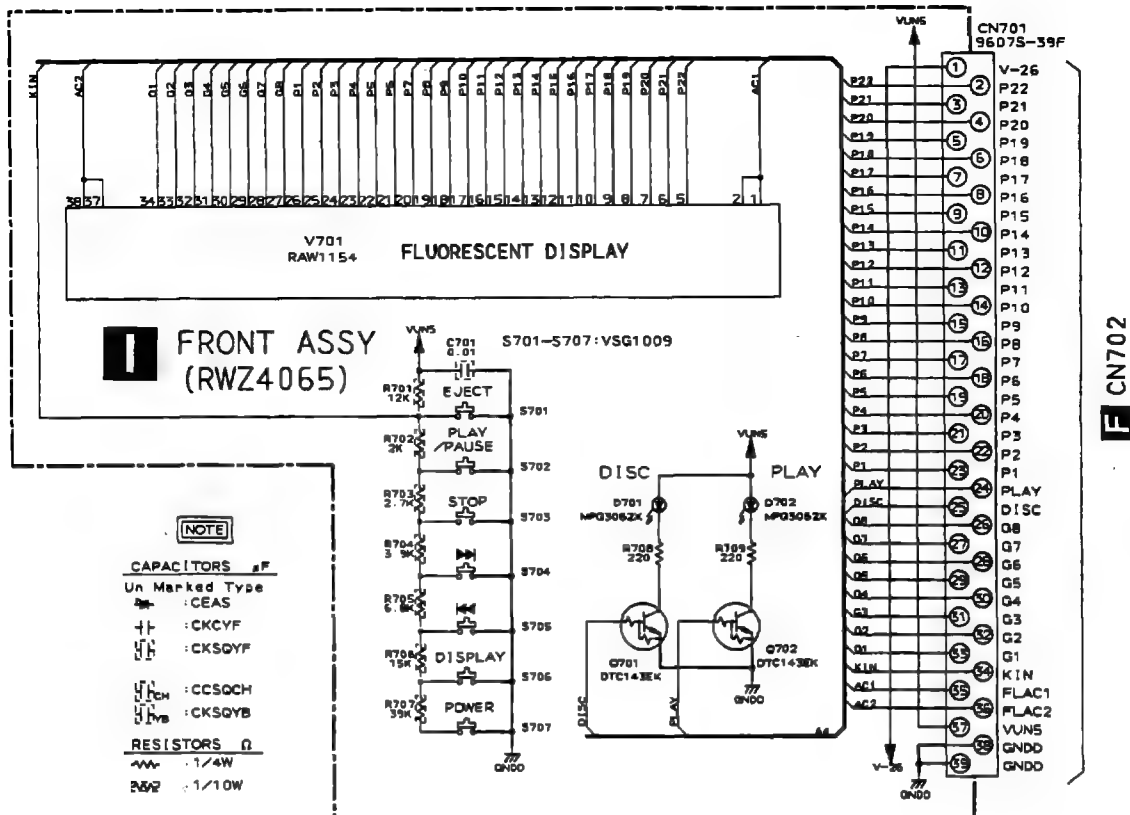
<p>② TP1- Pin 1 : PLAY MODE (RF) H : 500nsec/div</p> 	<p>⑤ IC201- Pin 1 : PLAY MODE (FODR) H : 1msec/div</p> 	<p>⑧ IC202- Pin 9 : TRACK SEARCH MODE (CADR) H : 200msec/div</p> 	<p>⑱ IC301- Pin 52 : PLAY MODE (1kHz) (PCMD) H : 500nsec/div</p> 
<p>② TP1- Pin 1 : TRACK SEARCH MODE (RF) H : 200μsec/div</p> 	<p>⑥ IC201- Pin 3 : PLAY MODE (TRDR) H : 1msec/div</p> 	<p>⑨ IC101- Pin 32 : PLAY MODE (EFM) H : 500nsec/div</p> 	<p>㉓ TRACK SEARCH MODE Upper:TP1-Pin1(RF) Lower:IC101-Pin 29 (MIRR) H : 200μsec/div</p> 
<p>③ TP1- Pin 6 : PLAY MODE (FOER) H : 10msec/div</p> 	<p>⑥ IC201- Pin 3 : 50T-JUMP(*1) MODE (TRDR) H : 1msec/div</p> 		
<p>④ TP1- Pin 2 : PLAY MODE (TRER) H : 10msec/div</p> 	<p>⑦ IC202- Pin 3 : PLAY MODE (SPDR) H : 50msec/div</p> 		
<p>④ TP1- Pin 2 : 50T- JUMP(*1)MODE (TRER) H : 1msec/div</p> 	<p>⑦ IC202- Pin 3 : TRACK SEARCH MODE (SPDR) H : 50msec/div</p> 	<p>⑯ IC301- Pin 54 : PLAY MODE (1kHz) (BCLK) H : 500nsec/div</p> 	<p>⑤③ IC301- Pin 38 : PLAY MODE (PCO) H : 10μsec/div</p> 
<p>⑤ IC201- Pin 1 : FOCUS-IN(*2) MODE (FODR) H : 200msec/div</p> 	<p>⑧ IC202- Pin 9 : PLAY MODE (CADR) H : 2sec/div</p> 	<p>⑰ IC301- Pin 50 : PLAY MODE (1kHz) (LRCK) H : 10μsec/div</p> 	









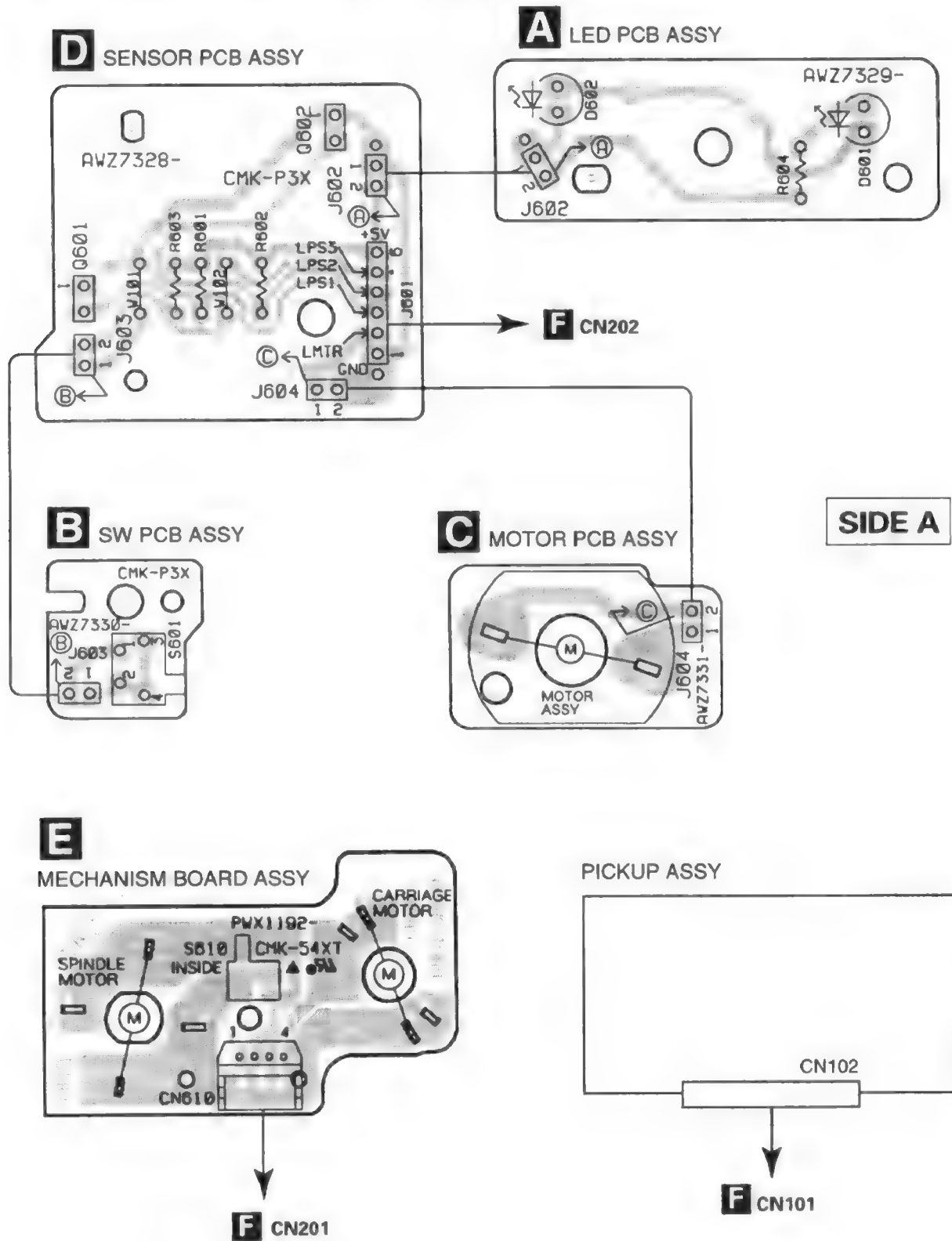


**SWITCHES** (Underline indicates switch position):

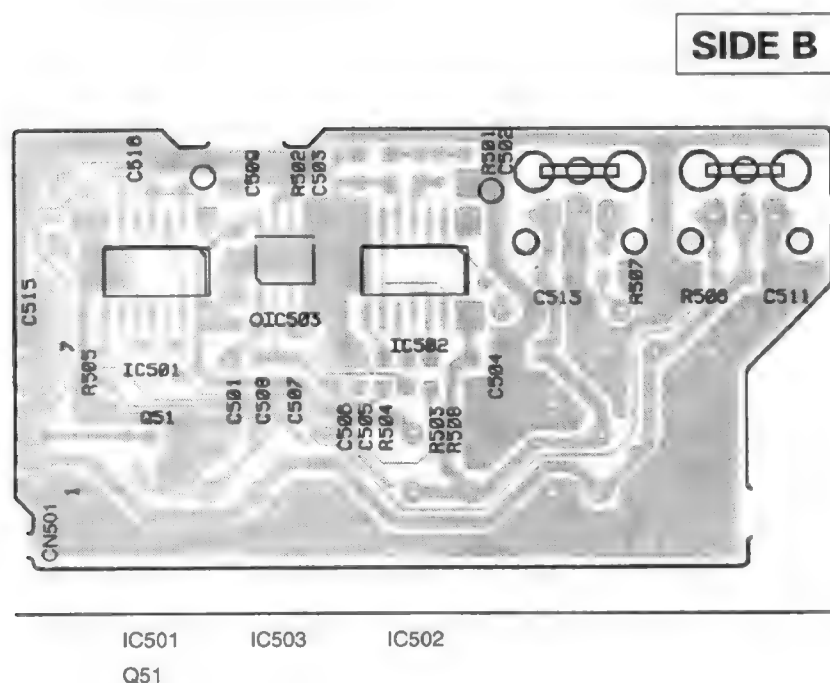
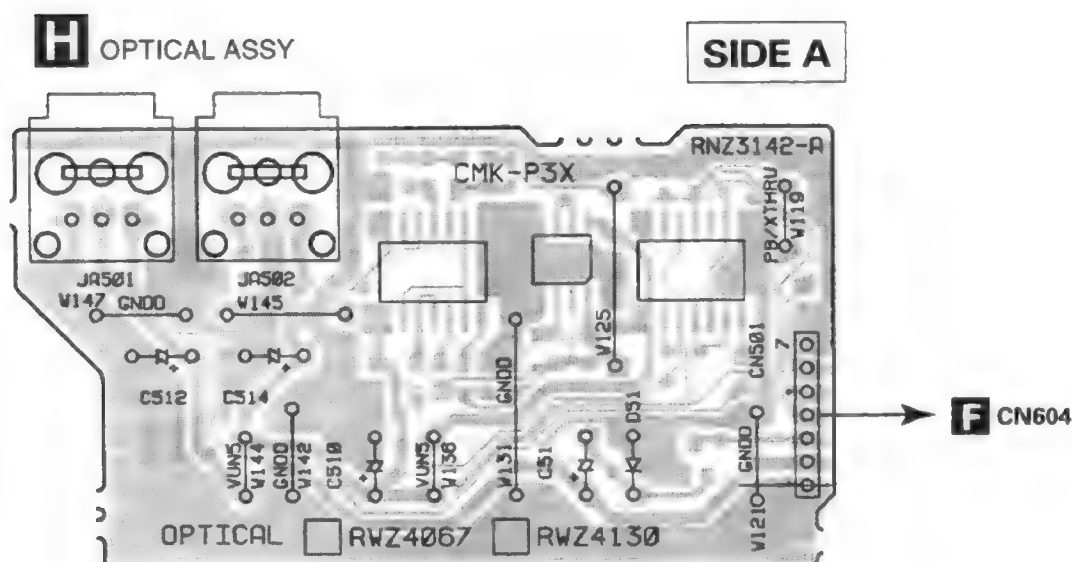
**FRONT ASSY**  
**S701:** ▲ EJECT  
**S702:** PLAY/PAUSE  
**S703:** ■ STOP  
**S704:** ►► ►►  
**S705:** ◀◀ ◀◀  
**S706:** DISPLAY  
**S707:** POWER STANDBY/ON

## 4. PCB CONNECTION DIAGRAM

### 4.1 LED PCB ASSY, SW PCB ASSY, MOTOR PCB ASSY, SENSOR PCB ASSY, MECHANISM BOARD ASSY AND PICKUP ASSY













## 4.2 OPTICAL ASSY



RNP1689-C

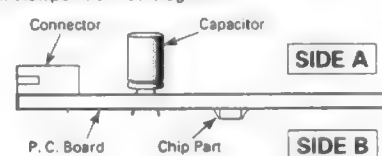
**NOTE FOR PCB DIAGRAMS:**

- 1 Part numbers in PCB diagrams match those in the schematic diagrams
- 2 A comparison between the main parts of PCB and schematic diagrams is shown below.

Symbol in PCB Diagrams	Symbol in Schematic Diagrams	Part Name
 B C E	 B C E	Transistor
 B C E	 B C E	Transistor with resistor
 D G S	 D G S	Field effect transistor
		Resistor array
		3-terminal regulator

3. The parts mounted on this PCB include all necessary parts for several destinations.  
For further information for respective destinations, be sure to check with the schematic diagram.

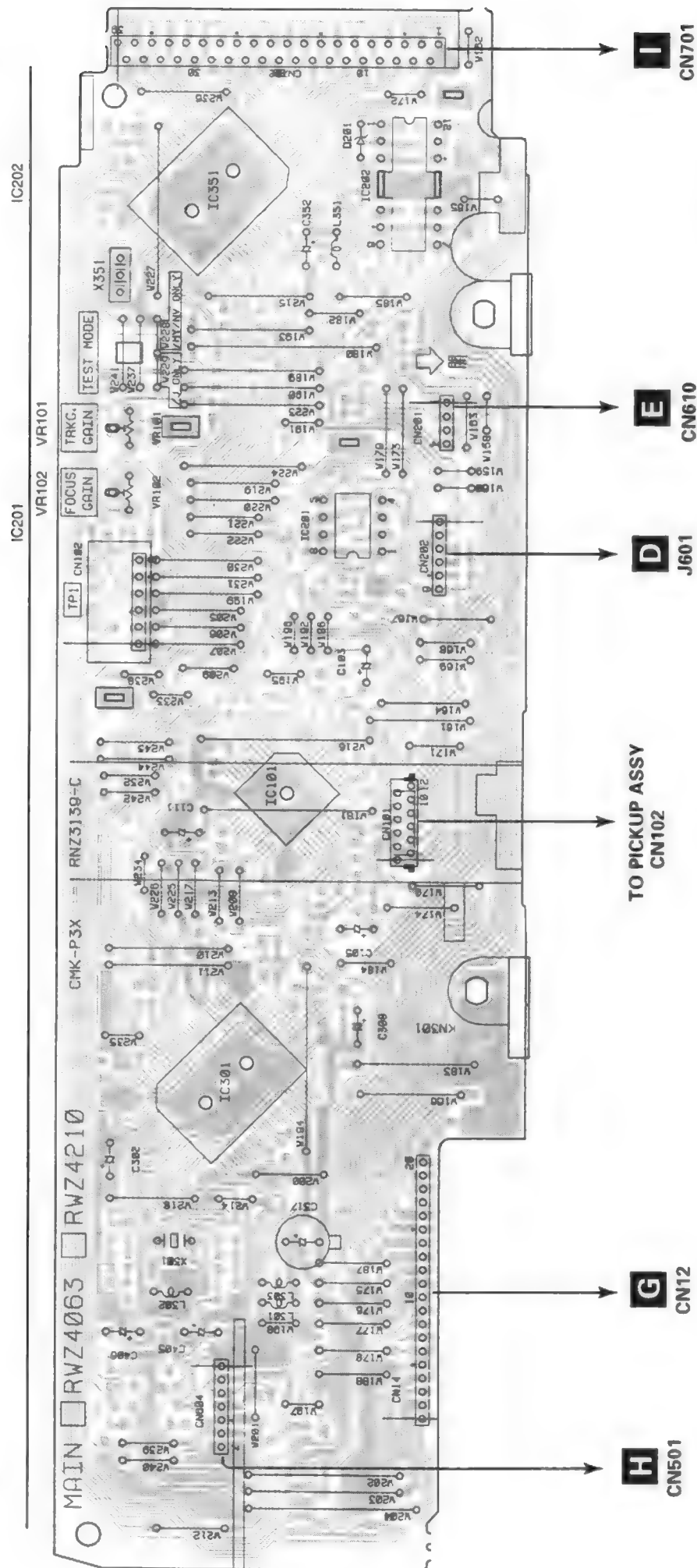
#### 4. Viewpoint of PCB diagrams



### 4.3 MAIN ASSY

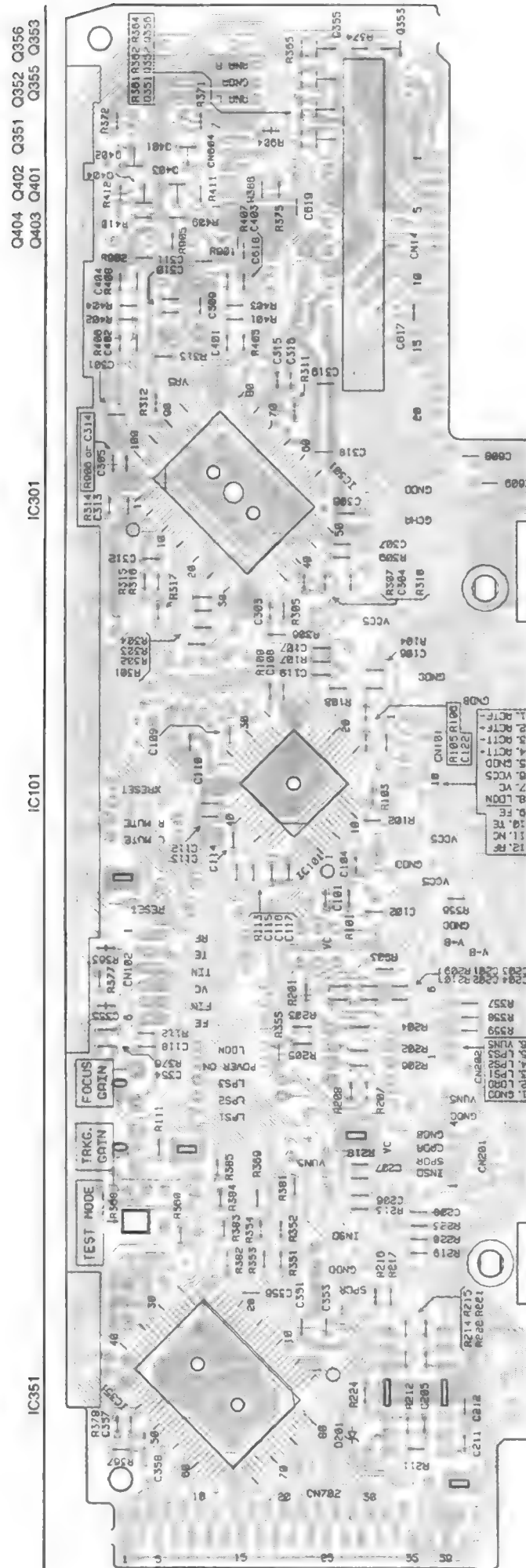
**SIDE A**

## MAIN ASSY



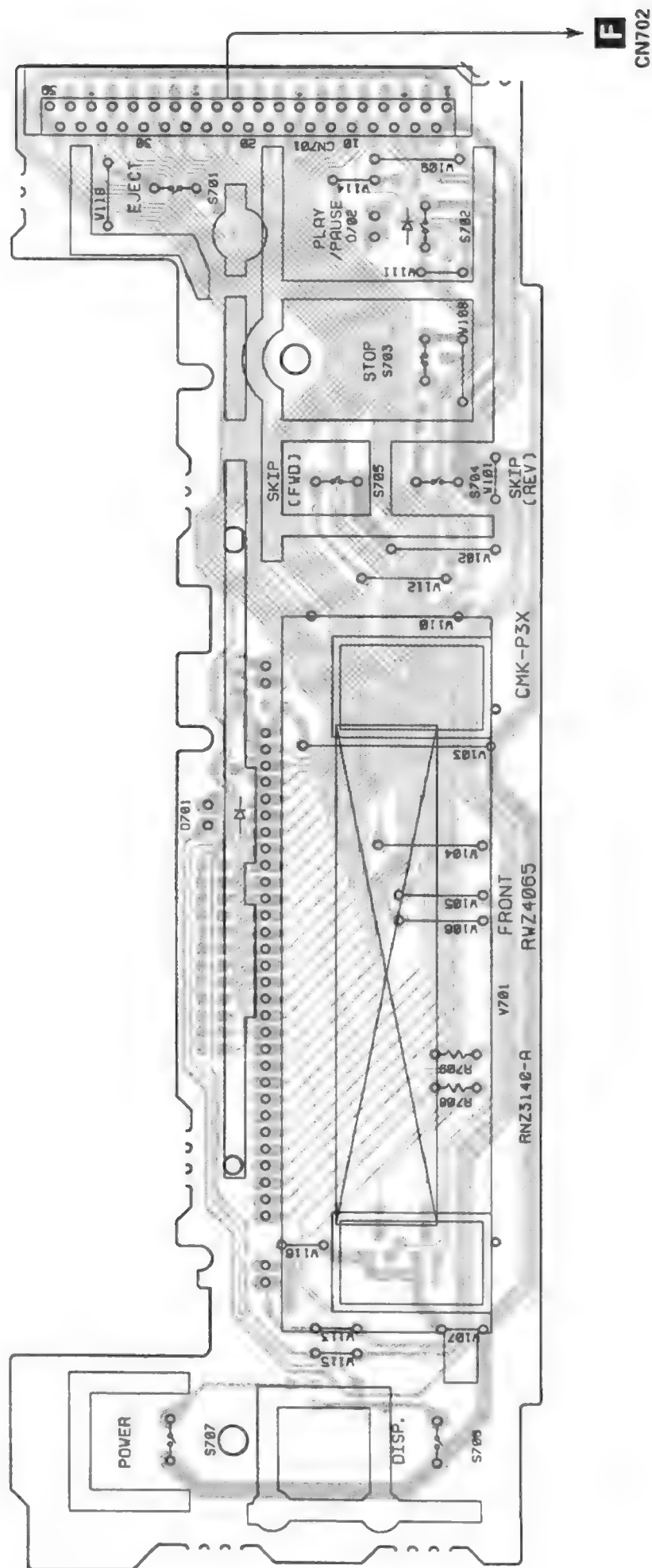
RNP1689-C



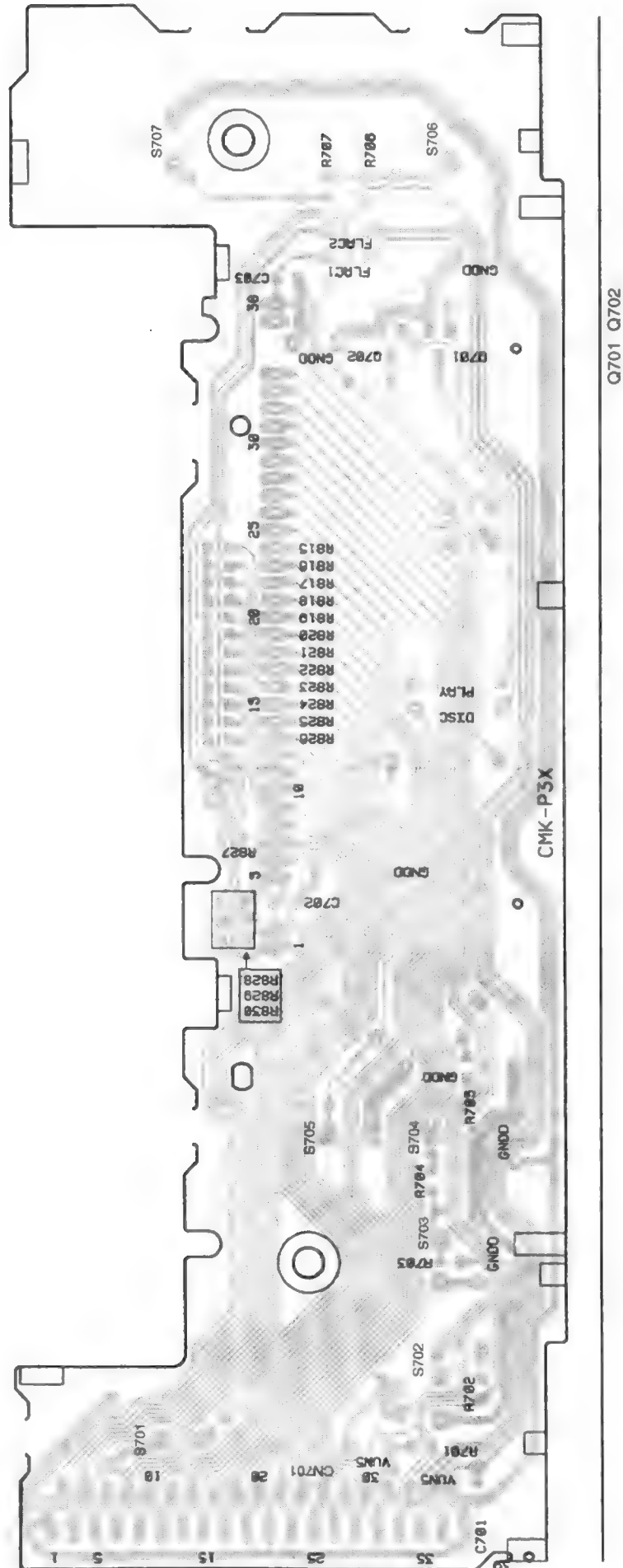
**F** MAIN ASSY

## SIDE A

FRONT ASSY



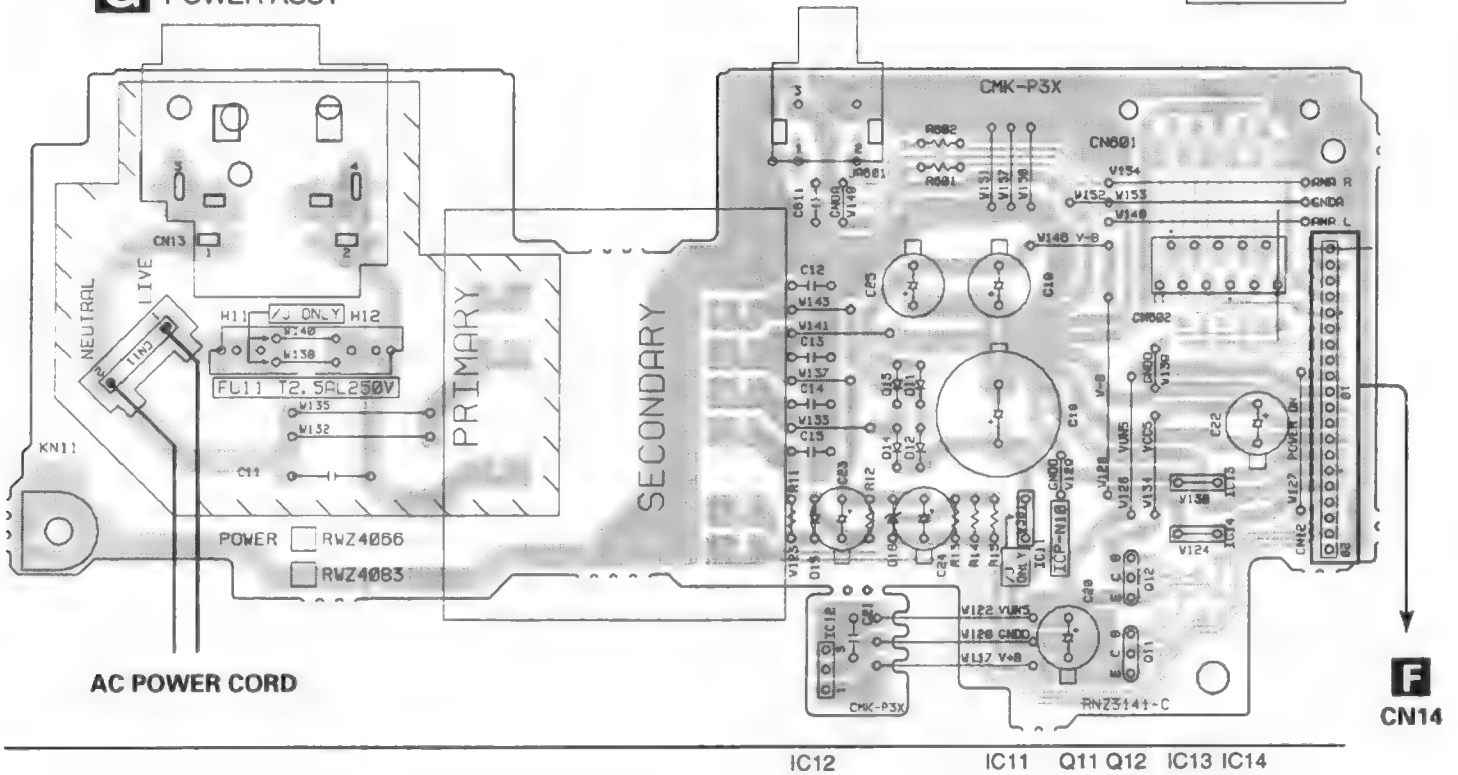
RNP1689-C



# 4.5 POWER ASSY

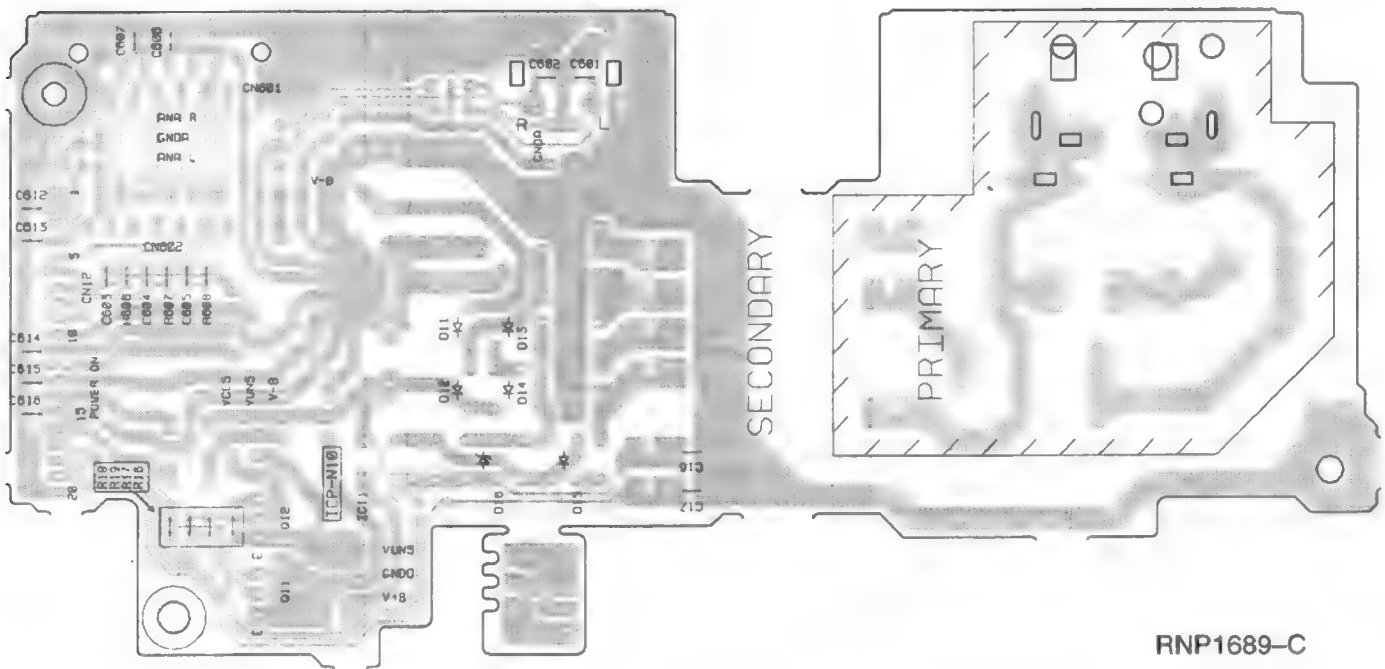
**G** POWER ASSY

**SIDE A**



**F** CN14

**SIDE B**



RNP1689-C



## 5. PCB PARTS LIST

NOTES : ● Parts marked by “NSP” are generally unavailable because they are not in our Master Spare Parts List.

- The  $\Delta$  mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.

- When ordering resistors, first convert resistance values into code form as shown in the following examples.

Ex. 1 When there are 2 effective digits (any digit apart from 0), such as 560 ohm and 47k ohm (tolerance is shown by J = 5%, and K = 10%).

$560\Omega \rightarrow 56 \times 10^1 = 561 \dots\dots\dots RD1/4PU \boxed{5} \boxed{6} \boxed{1} J$

$47k\Omega \rightarrow 47 \times 10^3 = 473 \dots\dots\dots RD1/4PU \boxed{4} \boxed{7} \boxed{3} J$

$0.5\Omega \rightarrow R50 \dots\dots\dots RN2H \boxed{R} \boxed{5} \boxed{0} K$

$1\Omega \rightarrow 1R0 \dots\dots\dots RS1P \boxed{1} \boxed{R} \boxed{0} K$

Ex. 2 When there are 3 effective digits (such as in high precision metal film resistors).

$5.62k\Omega \rightarrow 562 \times 10^1 = 5621 \dots\dots\dots RN1/4PC \boxed{5} \boxed{6} \boxed{2} \boxed{1} F$

Mark	No.	Description	Parts No.	Mark	No.	Description	Parts No.
<b>LIST OF PCB ASSEMBLIES</b>				<b>E MECHANISM BOARD ASSY</b>			
NSP	CD	SLOT-IN MECHA	AXA7014	<b>SWITCHES AND RELAYS</b>			
NSP	SL	MECHA PCB ASSY	AWX7007	S610			DSG1016
NSP	—	SENSOR PCB ASSY	AWZ7328	<b>OTHERS</b>			
NSP	—	LED PCB ASSY	AWZ7329	CN610	MT CONNECTOR 4P		173979-4
NSP	—	SW PCB ASSY	AWZ7330	<b>I FRONT ASSY</b>			
NSP	—	MOTOR PCB ASSY	AWZ7331	<b>SEMICONDUCTORS</b>			
NSP	SERVO	MECHA ASSY SL	AXA7017	Q701, Q702			DTC143EK
NSP	—	MECHANISM BOARD ASSY	PWX1192	D701, D702			MPG3062X
NSP	CDMAIN	ASSY	RWM1975	<b>SWITCHES AND RELAYS</b>			
	—	FRONT ASSY	RWZ4065	S701-S707			VSG1009
	—	OPTICAL ASSY	RWZ4067	<b>CAPACITORS</b>			
	—	POWER ASSY	RWZ4083	C701			CKSQYF103Z50
	—	MAIN ASSY	RWZ4210	<b>RESISTORS</b>			
<b>D SENSOR PCB ASSY</b>				R708, R709			RD1/4PU221J
<b>SEMICONDUCTORS</b>				Other Resistors			RS1/10S□□□J
	Q601, Q602		PS3062	<b>OTHERS</b>			
<b>RESISTORS</b>				CN701	FFC CONNECTOR (39P)		9607S-39F
All Resistors			RD1/4PU□□□J	V701	FL TUBE		RAW1154
<b>A LED PCB ASSY</b>				<b>H OPTICAL ASSY</b>			
<b>SEMICONDUCTORS</b>				<b>SEMICONDUCTORS</b>			
	D601, D602		AN306	IC501			TC74HC00AF
<b>RESISTORS</b>				IC502			TC74HC04AF
All Resistors			RD1/4PU□□□J	IC503			XLA4558F-P
<b>B SW PCB ASSY</b>				Q51			DTC124EK
<b>SWITCHES AND RELAYS</b>				D51			1SS254
S601			DSG1017	<b>CAPACITORS</b>			
<b>C MOTOR PCB ASSY</b>				C515			CCSQCH100D50
MOTOR PCB ASSY has no service part.				C502			CCSQCH120J50
				C508			CCSQCH121J50
				C510			CEAS101M10
				C51			CEAS1R0M50
				C512, C514			CEAS470M16
				C507			CKSQYB102K50
				C505, C506			CKSQYB222K50
				C501, C503, C504, C509, C511			CKSQYF103Z50
				C513, C516			CKSQYF103Z50

Mark	No.	Description	Parts No.
<b>RESISTORS</b>			
	All Resistors		RS1/10S□□□J

<b>OTHERS</b>			
	JA502	OPTICAL LINK IN	GP1F32R
	JA501	OPTICAL LINK OUT	GP1F32T
	CN501	7P SOCKET	KP200TA7L

## **G** POWER ASSY

### SEMICONDUCTORS

△	IC11	ICP-N10
△	IC12	NJM78M05FA
	Q12	2SB1238X
	Q11	DTC114TS
	D16	MTZJ18B

△	D11-D15	S5688G
---	---------	--------

### COILS AND FILTERS

△	L11	VTH1024
---	-----	---------

### CAPACITORS

△	C11 (10000pF/AC250V)	ACG7020
	C603-C605	CCSQCH221J50
	C24	CEAS101M25
	C23	CEAS101M35
	C18	CEAS332M16
	C19	CEAS471M16
	C20, C22	CEAS471M6R3
	C15	CKCYE472P2H
	C12-C14	CKCYF103Z50
	C611	CKCYF473Z50
	C601, C602	CKSQYB471K50
	C16, C17	CKSQYF103Z50
	C606, C607	CKSQYF473Z50

### RESISTORS

R12	RD1/4PU103J
R13-R15	RD1/4PU152J
R601, R602	RD1/4PU221J
Other Resistors	RS1/10S□□□J

### OTHERS

H11, H12	FUSE CLIP	AKR1003
CN602	11P JUMPER CONNECTOR	KPE11
JA601	2P PIN JACK	RKB1041
△	TERMINAL	RKC-061
CN601	11P SOCKET	RKP1754
CN12	CONNECTOR	TUC-P20P-B1
KN11	EARTH METAL FITTING	VNF1084

## **F** MAIN ASSY

### SEMICONDUCTORS

	IC101	CXA1372BQ
	IC301	CXD2519Q
⚠	IC201	LA6517
⚠	IC202	LA6520
	IC351	PD4741A
	Q403, Q404	2PD601A
	Q401, Q402	DTA124EK
	Q353	DTA144EK
	Q351, Q355, Q356	DTC114TK
	Q352	DTC124EK

Mark	No.	Description	Parts No.
	D201		MTZJ6.8B

### COILS AND FILTERS

L303	LAU1R0J
L302	LAU1R2J
L301, L351	LAU6R8J

### CAPACITORS

C309	CCSQCH100D50
C312	CCSQCH101J50
C401, C402	CCSQCH151J50
C311	CCSQCH220J50
C355	CCSQCH331J50

C403, C404	CCSQCH681J50
C405, C406	CEAL220M6R3
C111, C352	CEAL470M16
C103, C105	CEAL4R7M16
C308	CEALR47M50

C317	CEZA221M16
C302	CEZA470M16
C114, C119, C354, C357	CKSQYB102K50
C107, C112, C117, C205, C307	CKSQYB103K50
C101, C102, C104, C106	CKSQYB104K25

C211, C212	CKSQYB104K25
C304	CKSQYB152K50
C109, C113, C116	CKSQYB333K25
C115	CKSQYB472K50
C303	CKSQYB473K25

C118	CKSQYB561K50
C310	CKSQYF102Z50
C110, C122, C201-C204	CKSQYF103Z50
C206-C208, C301, C305, C313	CKSQYF103Z50
C315, C351, C353, C356, C358	CKSQYF103Z50

C608, C618	CKSQYF103Z50
C108, C316	CKSQYF473Z50

### RESISTORS

VR101, VR102 (22k)	RCP1103
Other Resistors	RS1/10S□□□J








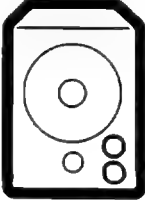

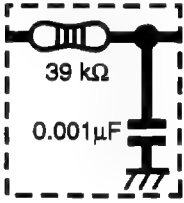
### OTHERS

CN101	FPC CONNECTOR (12P)	12FMZ-ABT
CN201	MT CONNECTOR (4P)	173981-4
CN202	6P JUMPER CONNECTOR	52147-0610
CN702	FFC CONNECTOR (39P)	9607S-39F
X301	(33.8688MHz)	ASS7000
CN604	7P PLUG	KM200TA7
CN14	CONNECTOR (20P)	TUC-P20X-B1
	PCB BINDER	VEF1040
CN102	6P SIDE POST	VKN-004
KN301	EARTH METAL FITTING	VNF1084
X351	(4.19MHz)	VSS1028


## 6. ADJUSTMENT

### 1. PREPARATIONS (準備)

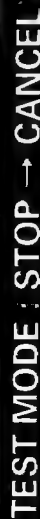
#### 1.1 Jigs and Measuring Instruments (使用測定器/治工具類)

 <p>8-cm DISC (With at least about 20 minutes recording) (20分程度信号の 入ったディスク)</p>	 <p>CD TEST DISC (YEDS-7)</p>	 <p>⊖ Precise screwdriver</p>	 <p>⊖ screwdriver (small)</p>	 <p>⊕ screwdriver (medium)</p>
 <p>Ball point hexagon wrench (size: 1.5mm) GGGK1002 ボールポイント付 六角 ドライバー (対辺 1.5mm)</p>	 <p>⊕ screwdriver (large)</p>	 <p>Low-frequency oscillator</p>	 <p>Dual-trace oscilloscope (10 : 1 probe)</p>	 <p>Low pass filter (39 kΩ + 0.001μF)</p>

#### 1.2 Necessary Adjustment Points (調整に必要な項目)

When (このような時)	Adjustment points
Exchange <b>PICKUP</b> (ピックアップを交換した時)	1.2.3.4.5.6. → Page 29~31
Exchange <b>MAIN ASSY</b> (MAIN ASSYを交換した時)	1.2.3.4.5.6. → Page 29~31
Exchange <b>SERVO MECH ASSY</b> (サーボメカASSYを交換した時)	1.2.3.4.5.6. → Page 29~31
Exchange <b>SPINDLE MOTOR</b> (スピンドルモーターを交換した時)	 ADJ → Page 9

# TEST MODE: ON



**PICKUP ASSY**

(REAR)

ADJUSTMENT SCREW  
(Radial direction)

ADJUSTMENT SCREW  
(Tangential tilt direction)

MAIN ASSY

TEST

VR102  
(FOCUS GAIN)

VR101  
(TRACKING GAIN)

CN102

W237

W241

MAIN ASSY

TP

1. RF
2. TE
3. TIN
4. VC
5. FIN
6. FE

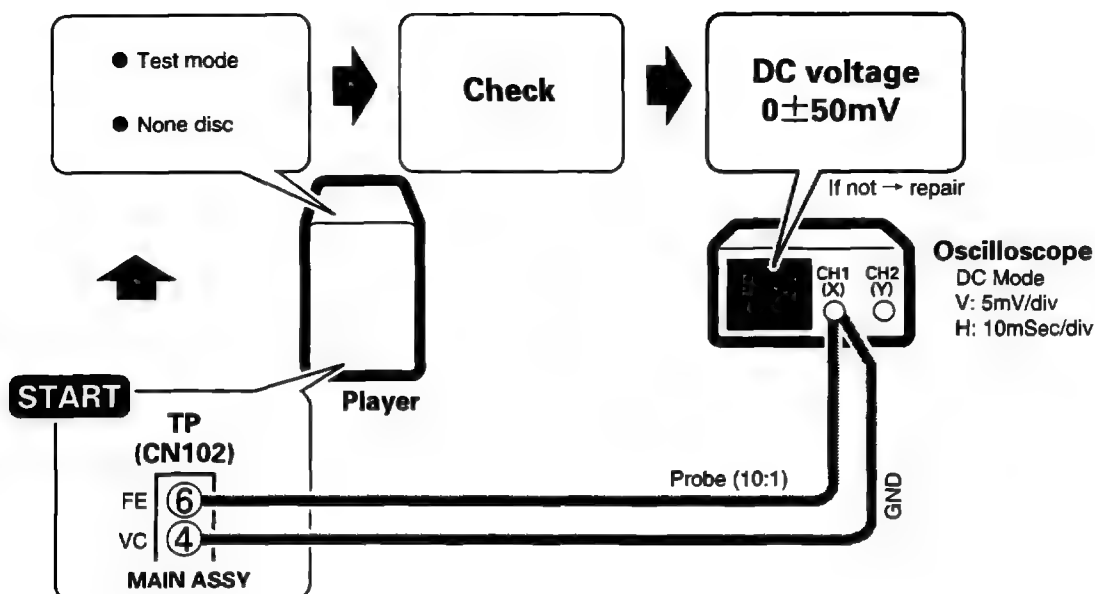
CN102

① ② ③ ④ ⑤ ⑥

## 2.3 Check and Adjustment (確認、調整)

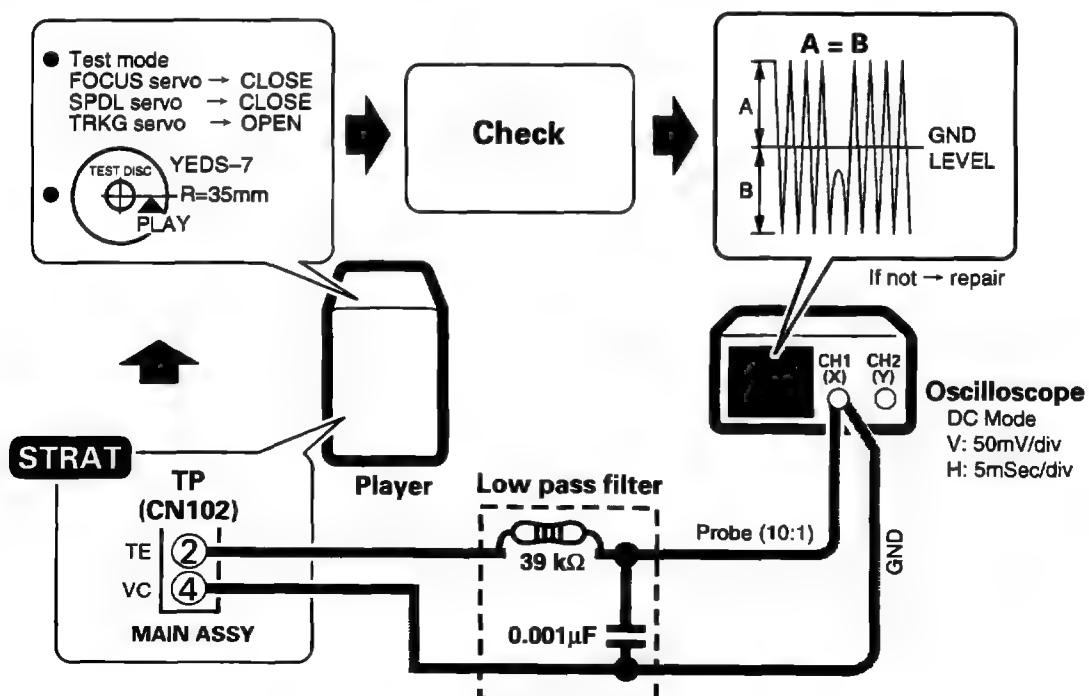
## 1. Focus Offset Check

(フォーカスオフセット確認)



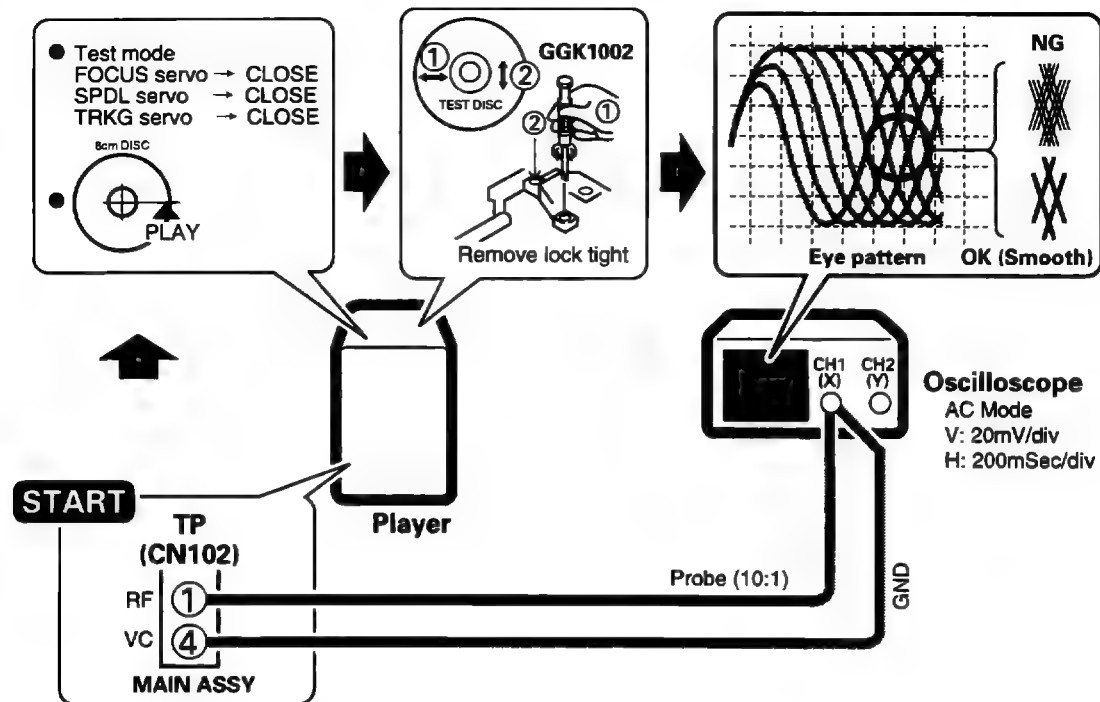
## 2. Tracking Error Balance Check

(トラッキングエラーバランス確認)



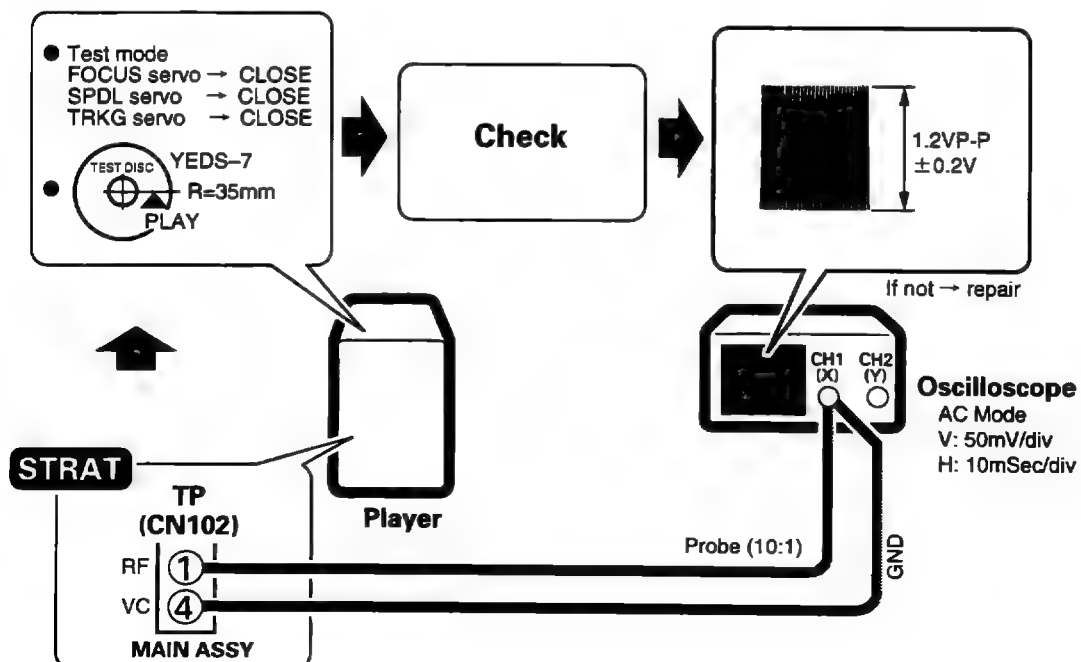
### 3. Pickup ①Radial/ ②Tangential Direction Tilt Adjustment

(ピックアップ①ラジアル方向②タンジェンシャル方向の傾き調整)



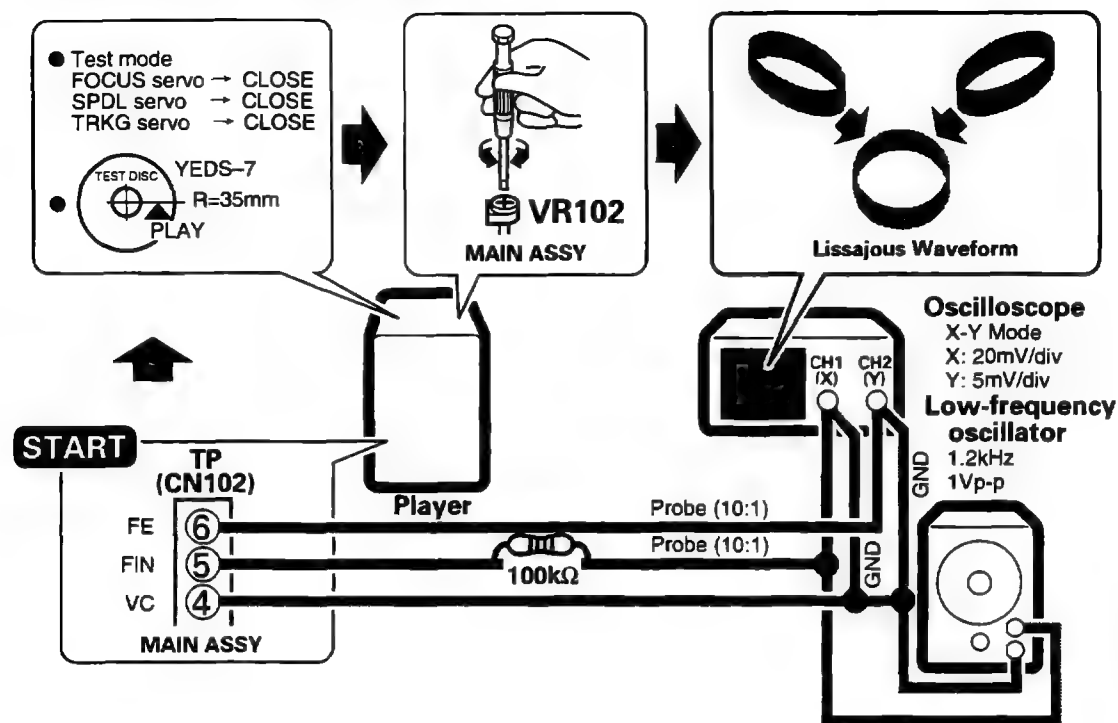
### 4. RF Level Check

(RFレベル確認)



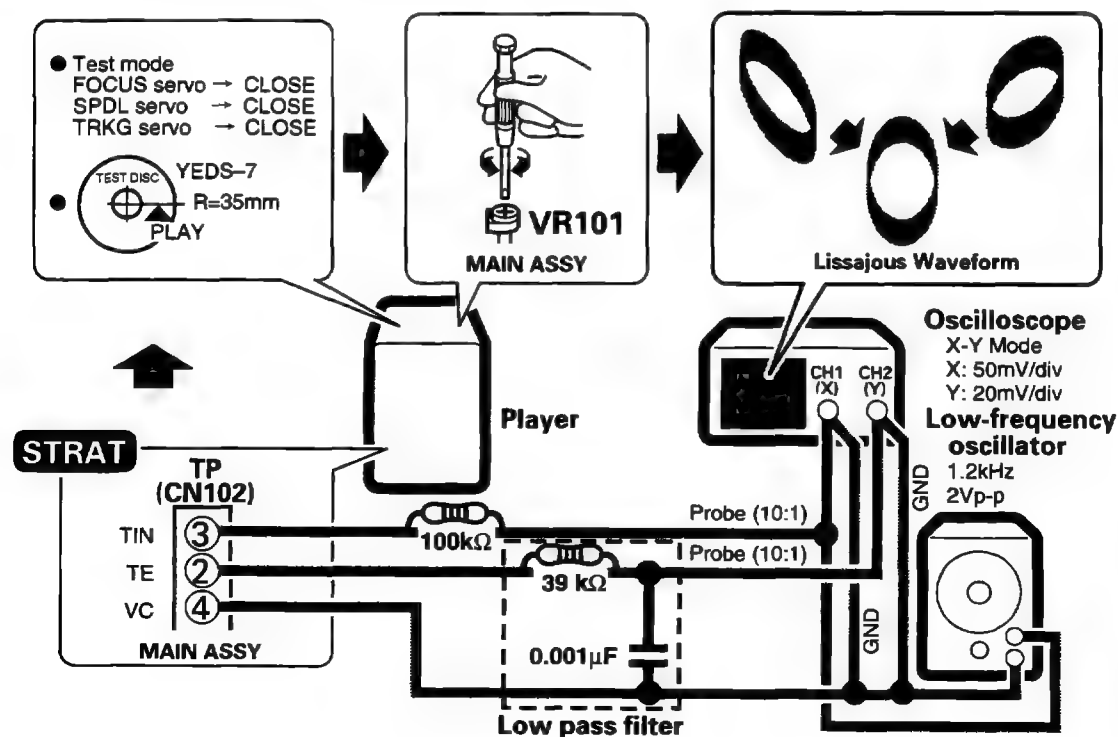
## 5. Focus Servo Loop Gain Adjustment

(フォーカサーボループゲイン調整)



## 6. Tracking Servo Loop Gain Adjustment

(トラッキングサーボループゲイン調整)



## 7. GENERAL INFORMATION

### 7.1 PARTS

#### 7.1.1 IC

#### ■ PD4741A (IC351: MAIN ASSY)

#### ● System Control Micro-computer

#### ● Pin Function

● The information shown in the list is basic information and may not correspond exactly to that shown in the schematic diagrams.

No.	Port Name	Pin Name	I/O	Description	Logic	Status
1   5	P94/FIP6 P90/FIP2	G7   G3	O	FL Grid output		
6	P81/FIP1	G2				
7	P80/FIP0	G1				
8	VDD	VDD	—	Power Supply		
9	P27/SCK0	RMUT	I	CH2/"0" Detection input	Detect=H	
10	P26/SO0/SB	R MUTE	O	Analog Mute output	MUTE ON=L	L
11	P25/SI0/SB	L MUTE	O		MUTE ON=L	L
12	P24/BUSY	XRESET	O	CXD2519Q System Reset	RESETON=L	L
13	P23/STB	XLAT	O	CXD2519Q Latch output	LAT=L	L
14	P22/SCK1	CD CLK	O	CXD2519Q Clock output		L
15	P21/SO1	CD DATA	O	CXD2519Q Data output		L
16	P20SI1	SQSO	I	Sub Q Data output		
17	RESET	RESET	I	CPU Reset	RESETON=L	
18	P74	LD ON	O	Laser Diode Control output	LDON=L	L
19	P73	POWER ON	O	Peripheral Circuit Power Supply Control output	POWON=H	L
20	AVss	AVss	—	Analog Ground		
21	P17/ANI7	LPS3	I	Slot-mecha Switch input	ACTIVE=L	
22	P16/ANI6	LPS2	I		ACTIVE=L	
23	P15/ANI5	LPS1	I		ACTIVE=L	
24	P14/ANI4	LMUT	I	CH1/"0" Detection input	Detect=H	
25	P13/ANI3	SENS	I	CXD2519Q SENS input		
26	P12/ANI2	GFS	I	CXD2519Q GFS input		
27	P11/ANI1	FOK	I	Focus Control Signal input	FOK=H	
28	P10/ANI0	KIN	I	Key input for A/D Converter		
29	AVDD	AVDD	—	Analog Power Supply		
30	AVREF	AVREF	I	Analog Reference Voltage		
31	P04/XT1	INSD	I	Inside SW input	ACTIVE=L	
32	XT2	—	—	Non Connection	OPEN	
33	Vss	Vss	—	Ground		



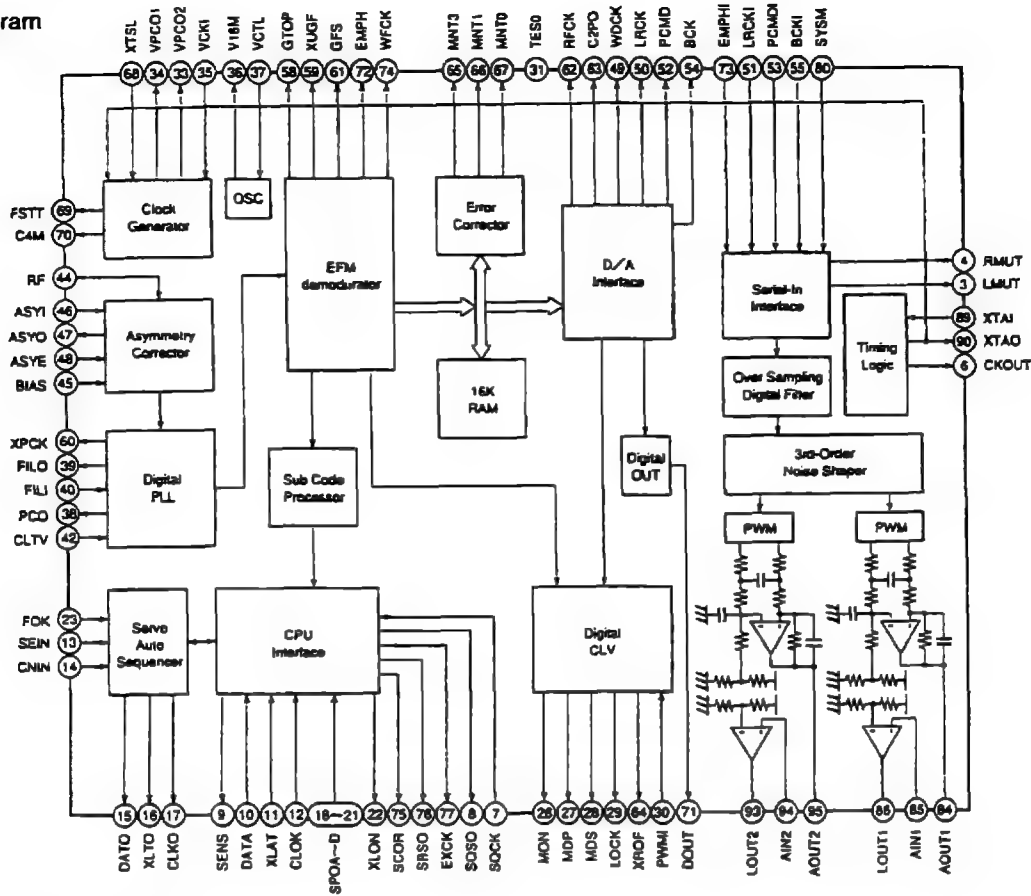
PD4741A

No.	Port Name	Pin Name	I/O	Description	Logic	Status
34	X1	X1	I	Connected to Ceramic Oscillator (4.19MHz)		
35	X2	X2	—			
36	P37	TEST	I	Switching Test Mode input	TEST=L	
37	P36/BUZ	J/EX	I	Switching Destination input	J model=H	
38	P35/PCL	—	O	Non Connection		L
39	P34/TI2	—	O			L
40	P33/TI1	LOUT	O	Loading Motor Control	OUT=H	L
41	P32/TO2	LIN	O		IN=H	L
42	P31/TO1	S R/E	I/O	Request input/output for Bus Communication	REQ=L	H
43	P30/TO0	S DATA	O	Data output for Bus Communication	ACTIVE=H	H
44	P03/INTP3	SCOR	I	CXD2519Q Sub Code Sync input		
45	P02/INTP2	S RDATA	I	Data input for Bus Communication		
46	P01/INTP1	S CLK	I	Clock input for Bus Communication		
47	P00/INTP0	REMO	I	Non Connection to Ground	GND	
48	IC(Vpp)	IC(Vss)	—	Programming Power Supply		
49	P72	PB/XTHRU	O	Optical Out Control output	ACTIVE=H	L
50	P71	PB ON	O	Non Connection	OPEN	L
51	P70	SYS DET	I	12V System Connection input	SYSTEM=H	
52	VDD	VDD	—	Power Supply		
53	P127/FIP33	—	O	Non Connection	OPEN	L
54	P126/FIP32	—	O			
55   60	P125/FIP31   P120/FIP26	P22   P17	O	Segment output		
61   68	P117/FIP25   P110/FIP18	P16   P9				
69	P107/FIP17	P8				
70	P106	FIP16				
71	VLOAD	VFDP		Negative Power Supply		
72   77	P105/FIP15   P100/FIP10	P6   P1	O	Segment output		
78	P97/FIP9	LED(PLAY)	O	LED Drive		
79	P96/FIP8	LED(DISC)				
80	P95/FIP7	G8	O	Grid output		

## ■ CXD2519Q (IC301: MAIN ASSY)

### ● EFM Decoder and D/A Converter

### ● Block Diagram



### ● Pin Assignment (Top view)



## ● Pin Function

CXD2519Q

No.	Pin Name	I/O	Description
1	VDD	—	Power Supply (+5V)
2	Vss	—	GND
3	LMUT	O	Lch "0" Detection Flag
4	RMUT	O	Rch "0" Detection Flag
5	TES2	O	Output Test Terminal; Normally Open
6	CKOUT	O	Master Clock Divider output Terminal; selects and outputs XTAL $\times 1$ , $\times 1/2$ , $\times 1/4$ , or "L" only.
7	SQCK	I	Clock input for SQSO leadout
8	SQSO	O	SubQ 80bit Serial output
9	SENS	O	SENS output; Outputs to CPU
10	DATA	I	Serial data input from CPU
11	XLAT	I	Latch input from CPU; Latches serial data at startup.
12	CLOCK	I	Serial data transmission clock input from CPU
13	SEIN	I	Sense input from SSP
14	CNIN	I	Track Jump Counter Signal input
15	DATO	O	Serial data output to SSP
16	XLTO	O	Serial data latch output to SSP; latches serial data at startup.
17	CLKO	O	Serial data transmission clock output to SSP
18	SPOA	I	Micro-computer Expansion Interface (input A)
19	SPOB	I	Micro-computer Expansion Interface (input B)
20	SPOC	I	Micro-computer Expansion Interface (input C)
21	SPOD	I	Micro-computer Expansion Interface (input D)
22	XLON	O	Micro-computer Expansion Interface (output)
23	FOK	I	Focus OK input Terminal Used for SENS output and servo auto sequencer.
24	VDD	—	Power Supply (+5V)
25	Vss	—	GND
26	MON	O	Spindle Motor ON/OFF Control output
27	MDP	O	Spindle Motor Servo Control
28	MDS	O	
29	LOCK	O	Samples GFS at 460Hz and outputs H when GFS is H; outputs L when L is output 8 times consecutively.
30	PWMI	I	Spindle motor remote control input
31	TES0	I	TEST Terminal; Normally GND
32	TES1	I	

No.	Pin Name	I/O	Description
33	VPCO2	O	Charge pump output for wide-range EFM PLL; ON/OFF controlled by address E FCSW.
34	VPCO1	O	Charge pump output for wide-range EFM PLL
35	VCKI	I	VCO2 oscillation input for wide-range EFM PLL
36	V16M	O	VCO2 oscillation output for wide-range EFM PLL
37	VCTL	I	VCO2 control voltage input for wide-range EFM PLL
38	PCO	O	Charge pump output for master PLL
39	FILO	O	Master PLL (slave = digital PLL) filter output
40	FILI	I	Master PLL Filter input
41	AVss	—	Analog GND
42	CLTV	I	VCO control voltage input for master
43	AVDD	—	Analog Power Supply (+5V)
44	RF	I	EFM Signal input
45	BIAS	I	Asymmetry circuit constant current input
46	ASYI	I	Asymmetry comparator voltage input
47	ASYO	O	EFM full-swing output (L=Vss; H=VDD)
48	ASYE	I	L: asymmetry circuit OFF H: asymmetry circuit ON
49	WDCK	O	D/A interface; word clock $f=2F_s$
50	LRCK	O	D/A interface; LR clock output $F=F_s$
51	LRCKI	I	LR Clock input
52	PCMD	O	D/A interface; serial data output (2's COMP, MSB first)
53	PCMDI	I	D/A interface; serial data input (2's COMP, MSB first)
54	BCK	O	D/A interface; bit clock output
55	BCKI	I	D/A interface; bit clock output
56	Vss	—	GND
57	VDD	—	Power Supply (+5V)
58	GTOP	O	GTOP output
59	XUGF	O	XUGF output
60	XPCK	O	XPLCK output
61	GFS	O	GFS output
62	RFCK	O	RFCK output
63	C2PO	O	C2PO output
64	XROF	O	XRAOF output

No.	Pin Name	I/O	Description
65	MNT3	O	MNT3 output
66	MNT1	O	MNT1 output
67	MNT0	O	MNT0 output
68	XTSL	I	X'tal selection input terminal; X'tal is L when input is 16.9344MHz and H when input is 33.8688MHz.
69	FSTT	O	2/3 divider output of terminal Nos. 80 and 90
70	C4M	O	4.2336MHz output; outputs VCK1 1/4 divider during CAV-W mode.
71	DOUT	O	Digital Out output terminal
72	EMPH	O	Outputs H when playback disc emphasis is ON; outputs L when emphasis is OFF.
73	EMPHI	I	inputs H when de-emphasis is ON; inputs L when de-emphasis is OFF.
74	WFCK	O	WFCK output
75	SCOR	O	Outputs H when either subcode sync S0 or S1 is detected.
76	SBSO	O	SubP - W serial output
77	EXCK	I	Clock input for SBSO leadout
78	Vss	—	GND
79	VDD	—	Power Supply (+5V)
80	SYSM	I	Mute input terminal. Active=H
81	NC	—	
82	AVss	—	Analog GND
83	AVDD	—	Analog Power Supply (+5V)
84	AOUT1	O	Lch Analog output terminal
85	AIN1	I	Lch OPAMP input terminal
86	LOUT1	O	Lch LINE output terminal
87	AVss	—	Analog GND
88	XVDD	—	Power Supply for Master Clock
89	XTAI	I	Crystal oscillation circuit input terminal; when master clock is input from an external source, it is input through this terminal.
90	XTAO	O	Crystal oscillation circuit output terminal
91	XVss	—	GND for Master Clock
92	AVss	—	Analog GND
93	LOUT2	O	Rch LINE output terminal
94	AIN2	I	Rch OPAMP input terminal
95	AOUT2	O	Rch Analog output terminal

No.	Pin Name	I/O	Description
96	AVDD	—	Analog Power Supply (+5V)
97	AVss	—	Analog GND
98	NC	—	
99	NC	—	
100	XRST	I	System Reset. L= Reset

Notes:

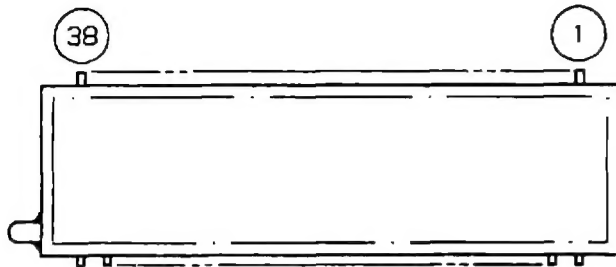
- PCMD is the 2's complement output of MSB first.
- GTOP monitors Frame Sync protection conditions (H: Sync protection window Open).
- XUGF is the negative pulse with Frame Sync obtained from the EFM signal; signal before Sync protection.
- XPLCK is the inversion of the EFM PLL clock; PLL is created so that edges or points of the leading edge and EFM signal are aligned.
- GFS becomes H when Frame Sync and interpolation timing are aligned.
- RFCK is the 136μ cycle signal (normally instantaneous) made with X'tal accuracy.
- C2PO is the signal that indicates the data error status.
- XRAOF is the signal generated when 16k RAM exceeds the  $\pm 4F$  jitter margin.

### 7.1.2 DISPLAY

## ■ RAW1154 (V701: FRONT ASSY)

- FL Indicator Tube

- ## ● Pin Assignment

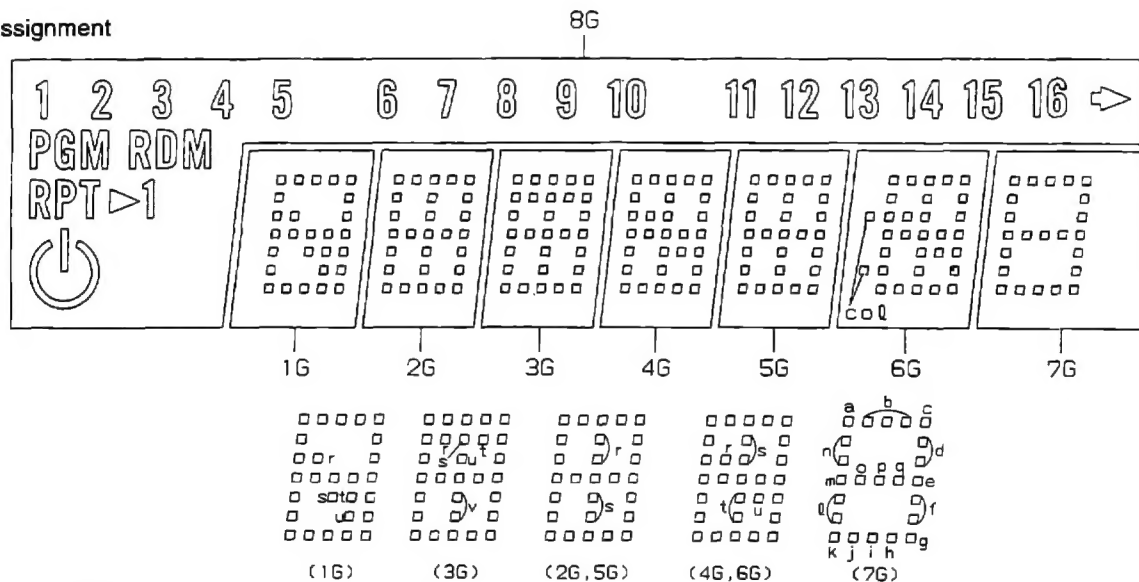


NOTE 1) F1,F2 --- Filament  
2) NP ----- No pin  
3) DL ----- Datum Line  
4) 1G~8G --- Grid

- ### ● Pin Connection

PIN NO.	38	37	36	35	34	33	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
CONNECTION	F2	F2	N	N	1	2	3	4	5	6	7	8	P	P	P	P	P	P	P	P	P	P	P	1	1	1	1	1	1	1	2	2	2	2	N	N	F	F

- ## ● Grid Assignment



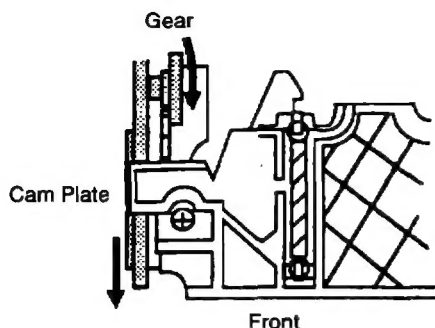
- ### ● Anode Connection

	1G	2G	3G	4G	5G	6G	7G	8G
P1	a	a	a	a	a	a	a	1
P 2	b	b	b	b	b	b	b	2
P 3	c	c	c	c	c	c	c	3
P 4	d	d	d	d	d	d	d	4
P 5	e	e	e	e	e	e	e	5
P 6	f	f	f	f	f	f	f	6
P 7	g	g	g	g	g	g	g	7
P 8	h	h	h	h	h	h	h	8
P 9	i	i	i	i	i	i	i	9
P10	j	j	j	j	j	j	j	10
P11	k	k	k	k	k	k	k	11

	1G	2G	3G	4G	5G	6G	7G	8G
P12	l	l	l	l	l	l	l	12
P13	m	m	m	m	m	m	m	13
P14	n	n	n	n	n	n	n	14
P15	o	o	o	o	o	o	o	15
P16	p	p	p	p	p	p	p	16
P17	q	q	q	q	q	q	q	➡
P18	r	r	r	r	r	r	-	PGM
P19	s	s	s	s	s	s	-	RDM
P20	t	-	t	t	-	t	-	RPT
P21	u	-	u	u	-	u	-	>1
P22	-	-	v	-	-	col	-	(b)

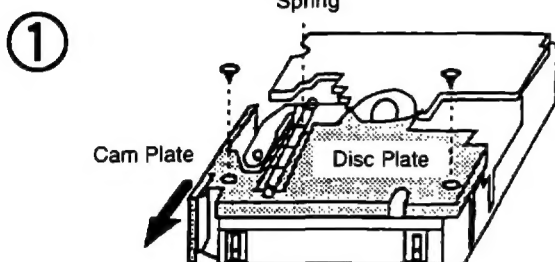
## 7.2 DISASSEMBLY

### ● CD Disc Manual Removal Method

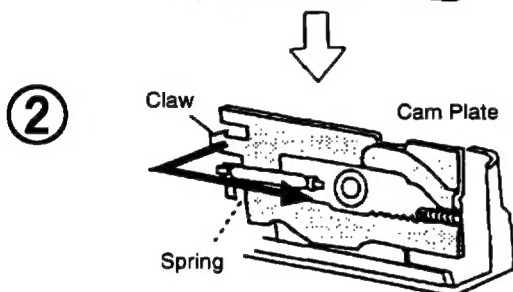


Turn the gear in arrow direction to the front, and move the cam plate to the front. When the gear is turned until the cam plate comes to the very front position (EJECT position), the CD disc will be pulled out.

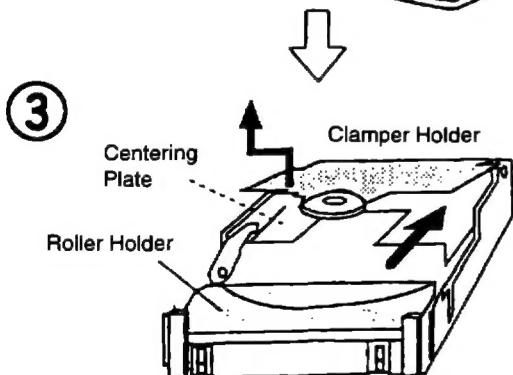
### ● Servo Mechanism Exchange Method and Mechanism Adjustment Method



- ① Remove the spring and the two screws, and then remove the disc plate. Move the cam plate to the very front position (EJECT position). (refer to the CD Disc Manual Removal Method.)

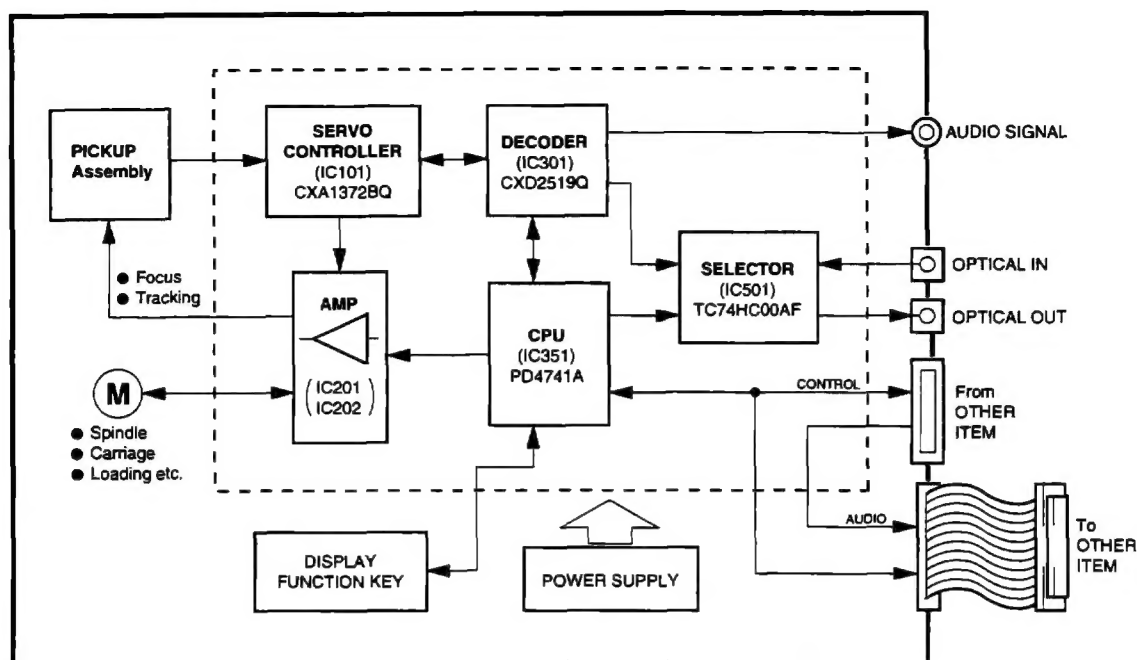


- ② Remove the spring. Remove to the front while pulling the claw part of the cam plate to the outside.



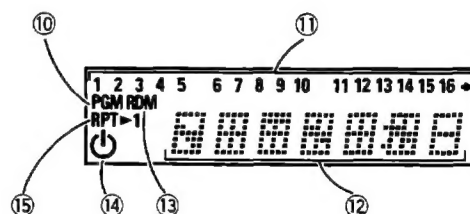
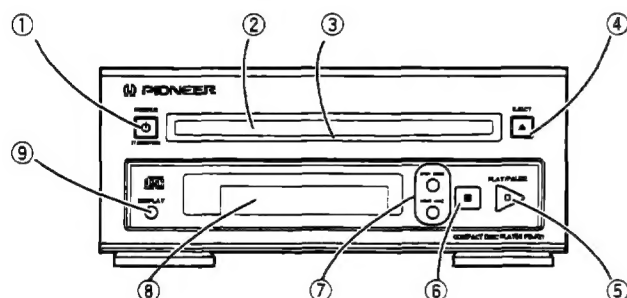
- ③ Raise the clamber holder lightly, slide it in arrow direction, and remove it. When the centering plate is moved to the rear, the four screws fixing the servo mechanism become visible. When these screws are removed, the servo mechanism assembly can be removed.  
**TAN and RAD adjustment are excuted from above with the clamber holder and the roller holder removed and only the magnet clamber placed onto the CD disc.**

## 7.3 BLOCK DIAGRAM



## 8. PANEL FACILITIES AND SPECIFICATIONS

### ■ PANEL FACILITIES



#### ① POWER, STANDBY/ON switch

#### ② Disc slot

#### ③ Disc indicator

Lights when a disc is loaded

#### ④ CD EJECT button (▲)

#### ⑤ PLAY/PAUSE button, play indicator

#### ⑥ Stop button (■)

#### ⑦ Manual/Track-search buttons

(◀◀, ▶▶)

#### ⑧ Display Section

#### ⑨ DISPLAY button

#### [DISPLAY SECTION]

#### ⑩ Lights during program input and playback

#### ⑪ Music calendar (track display)

#### ⑫ Track and time display

#### ⑬ Lights during random play

#### ⑭ Standby indicator

#### ⑮ Lights during repeat play

RPT: all-track repeat

RPT▶1: one-track repeat

## ■ SPECIFICATIONS

Type .....	Compact Disc digital audio system
Usable discs .....	Compact Discs
Channels .....	2 (stereo)
Frequency Response .....	4 Hz - 20 kHz
Signal-to-Noise Ratio .....	110 dB (EIAJ)
Wow and Flutter .....	Limit of measurement (0.001%) or less (EIAJ)
Power Requirements .....	AC 230 V, 50/60 Hz
Power Consumption .....	12 W
Dimensions .....	190 (W) x 80.5 (H) x 274 (D) mm
Weight .....	2.0 kg

## Accessories

Warranty Card ..... 1

**NOTE:**

*Specifications and design subject to possible modification without notice, due to improvements.*